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PERNICIOUS AND RESISTANT FORMS OF MALARIA

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Recently James (1941) has shown that different strains of malignant tertian parasites vary considerably in their virulence and response to treatment. Similar findings have been recorded by other observers. According to Rogers and Megaw (1942) certain strains of malignant tertian parasites give rise to very severe attacks which need large doses of quinine or atebrin if life is to be saved. Some cases prove refractory even to intravenous quinine. Low and Fairley (1941), and James (*loc. cit*) recorded similar findings with certain strains in experimentally induced malaria. In this paper, 510 cases of severe malaria including pernicious and resistant forms are recorded, and the treatment of such cases discussed.

CLINICAL FEATURES

Physical signs and symptoms were diverse and the following types were encountered.

A. *Cerebro-spinal*—Epileptiform fits—7; tetanic convulsions—3; tetanic convulsion of hemiplegic distribution—1; generalised rigidity of the whole body with spasms of the left upper extremity—2, in one of them a big area of skin and muscle over the left suprascapular area were continually scratched, and in the other the region over the throat, were scratched off and on, bleeding profusely; paraplegia—1; meningitis—7; hyperpyrexia—39; delerium—17; coma—12; paroxysmal shrieking at unseen terror—2; uncontrollable weeping—3; vacant staring and uncontrollable laughter—1; marked tenderness all over the body and shrieking if touched—3; total—98.

B. *Pulmonary*—Bronchitis—68; lobar pneumonia—7; bronchial asthma—12; hæmoptysis—3; total—90.

C. *Abdominal*—Dysentery—43; choleraic diarrhœa—7; severe epigastric pain, incessant vomiting, and constipation—2; severe vomiting and diarrhœa—5; hæmetemesis—1; severe intestinal hæmorrhage—3; acute yellow atrophy of the liver—1; ascites—1; total—63.

D. *Cutaneous*—Urticaria—2; purpuric hæmorrhages in the skin and conjunctiva—3; cyanosis, swelling, and intense pain the toes—1; total—6.

E. *Hæmolytic*—Blackwater fever—41; acute hæmolytic anæmia—3; total—44.

F. *Acute tender and marked swelling of the tongue*—1.

G. *Acute diabetes*—1. He required 240 units of insulin per day for three days.

H. *Cardiac*—Symptoms of coronary thrombosis—1.

I. *Acute mastitis*—2.

J. *Typhoid-like malaria* resisting the action of quinine or mepacrine—53.

K. *Malaria with complications*—Lobar pneumonia—68; bacillary dysentery—38; amoebic dysentery—13; heatstroke—19; beri-beri—13; total—153.

Out of 510 cases treated, 378 were due to malignant tertian, 57 due to benign tertian, and 75 due to malignant and benign infections and 36 showed multiple infections.

It was found that severe attacks occurred with (*a*) heavy infection, (*b*) mixed infection, (*c*) multiple infection, (*d*) primary attacks and (*e*) virulent and resistant strains of parasites. The severe attacks which occurred with benign tertian infection showed that the so called benign tertian is not always benign. Morphologically in many of the severe cases the ring forms were smaller in size when compared with normal ones.

Physical signs of bronchitis and pneumonia caused by malaria were seldom associated with leucocytosis and counts above 12,000 were rare. This was helpful in excluding pneumococcal pneumonia. A tendency towards leucocytosis and a rise in the blood-platelet count was, however, found in some of the hæmorrhagic and cerebral cases, *e.g.*, in one of the latter cases there was a leucocytosis of 18,000, and in another, who died of sagittal sinus thrombosis, the average platelet count was 420,000 per c.mm.

In all cerebral cases the cerebrospinal fluid pressure was found to be increased. In 19 of them the proteins were slightly increased and the cell count varied between 6 and 12 per c.mm.

An initial blood sugar estimation done in ten cases showed a very low blood sugar level, varying between 60 and 110 mg. per cent in three of them, and between 90 and 130 mg. per cent in the remaining seven.

Rapid wasting, if a generous diet was not given, was a prominent feature of all the cases. 13 of the patients had frank beri-beri at the onset of treatment, and in 47 control cases who were not given additional doses of vitamin B_1, symptoms and signs of deficiency occurred between the third and the ninth day in 23 of them. In hyperpyrexial forms some of the patients were still having rigors at temperatures between 106°F and 108°F. These findings necessarily showed that

temperature must be checked rectally. The presence of rigor and cold and clammy hands of a patient *in extremis* inspite of a high rectal temperature, may otherwise lead to the institution of wrong treatment.

Clinically convulsions at the onset of disease were not of grave prognosis, but those towards the end of the disease were very dangerous and caused rapid deterioration in the patient's condition, *e.g.,* in one case three successive convulsions in five minutes caused the death of the patient from respiratory failure, and no restorative measures were of any avail.

In algid cases, characterised by shallow respiration, thready pulse, falling blood pressure, profuse cold perspiration, and progressive impairment of mental acuity, it was found that the fluid loss through sweat may be very excessive, *e.g.,* in one of the cases it was estimated at ten pints in 24 hours by weighing bed sheets before and after they were wet with sweat; loss of sweat by evaporation of course could not be accounted for.

Action of Drugs

Routine antimalarial treatment, consisted of quinine gr. 10 t.d.s. for three days, followed successively by mepacrine gm. 0·1 t.d.s. for five days, period of rest for two days, and pamaquine gm. 0·01 b.d. for five days. In some cases relapses occurred during the course of mepacrine administration after the temperature had been controlled by quinine, or after its completion, during the period of rest, pamaquine administration, or shortly after antimalarial treatment was finished. It happened even if mepacrine was given parenterally. The relapse was however controlled by quinine again. (Graphs 1 and 2).

In severe cases also quinine was found to be more potent; the action in malignant tertian infections was however slow. Against the resistant strains it was found that either drug had no advantage over the other. In three cases of malignant tertian infection, quinine failed to have any effect on the parasites and cerebral attacks followed after the administration of 150, 180, and 270 grains of quinine respectively, at 30 to 40 grains per day. Mepacrine had no effect on the parasites in doses of 1·2 gm. in two cases, 1·5 gm. in three cases, and 1·8 gm. in one case at 0·1 gm. t.d.s. In another case cerebral attack followed after 2·1 gm. of mepacrine had been administered. Parenteral administration of quinine or mepacrine made no difference. All the four cases who developed cerebral attacks died, and antopsy showed positive smears from brain, spleen, and bone-marrow.

In 53 cases the routine antimalarial treatment had incomplete or no effect on the fever, even when given parenterally. In seven of these cases pamaquine was combined with 15 grs. of quinine without any beneficial effect. But in all cases when quinine gr. 10 and mepacrine gm. 0·1 t.d.s. were given together, the results were dramatic. (Graphs 3 and 4). The temperature dropped to normal in 48 hours, and in no case were parasites found in blood film or sternal puncture smears after 72 to 96 hours. These findings proved useful in the treatment of all pernicious and resistant cases with absolute effect. No relapse occurred during the course of combined treatment, or during six to eight weeks of convalescence, except in one case where a relapse occurred after 12 days of completion of treatment.

In one cerebral case with tetanic convulsions of hemiplegic distribution, due to heavy malignant tertian infection, symptoms recurred after 24 hours. Blood was still positive and both normal and breaking down rings were found, although scantier than before. There was a leucocytosis of 18,000, with 84 per cent polymorphs in the differential count. No response occurred in 12 hours with quinine and mepacrine combined and these were stopped. Sulphapyridine was given in doses of 9 gm. daily for six days. All symptoms subsided within 48 hours.

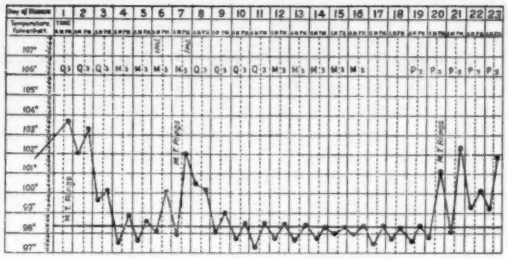
Sulphapyridine was found to exert a definite effect on malarial parasites. This proved of great value in treating malaria complicated by lobar pneumonia or bacillary dysentery. Antimalarial drugs were held in abeyance and the complications treated with sulphapyridine. With few exceptions the response was adequate and similar to that obtained in a case of lobar pneumonia or bacillary dysentery without malaria. Antimalarial course was given after treatment with sulphapyridine was finished. Severe toxic symptoms with rapid deterioration of patient's condition, which could be wrongly ascribed to the disease, occurred in some cases if sulphapyridine was combined with quinine, but no untoward symptoms occurred if it was combined with mepacrine.

Treatment

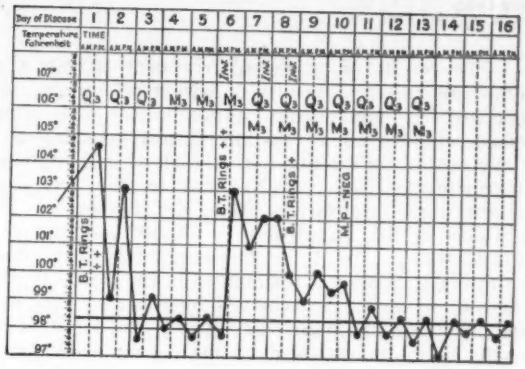
Quinine bihydrochloride gr. 5 to 10 intravenously, and gr. 10 with mepacrine 0·1 gm. intramuscularly were given stat. The latter was repeated six hourly for one or two doses, when improvement usually followed and the drugs were given in combination by mouth. The course consisted of quinine gr. 35 to 40 and mepacrine gm. 0·3 on the first day, followed by quinine gr. 10 and mepacrine gm. 0·1 t.d.s. for the next days.

In giving intramuscular injection, a dilution of quinine gr. 1 in at least 1 c.c. of water was used, and grs. 10 to 15 were injected into the muscles 3″ to 3½″ posterior to the anterior superior iliac spine, followed by a heavy massage and movements of the hipjoint to diffuse it. The needle used was sufficiently long and driven vertically down into the muscles, so that quinine was injected into the muscles and not into subcutaneous tissues. These precautions insured absorption and in spite of the formidable array of objections raised against the use of intramuscular quinine, intramuscular injections were given without any ill effects.

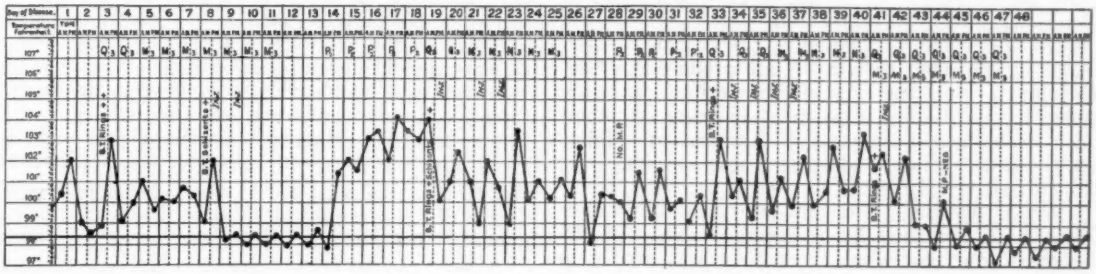
In administration of quinine intravenously, it was found that 2 to 3 grains could be injected straightaway, and further rate of injection could be controlled by avoiding the following symptoms of intolerance, (1) tightness in the chest and embarrasment of respirations, (2) hot sensation all over the body, (3) staring expression, restlessness and giddiness, (4) nausea and vomiting and (5) palpitation. At the earliest onset of these symptoms further injection was



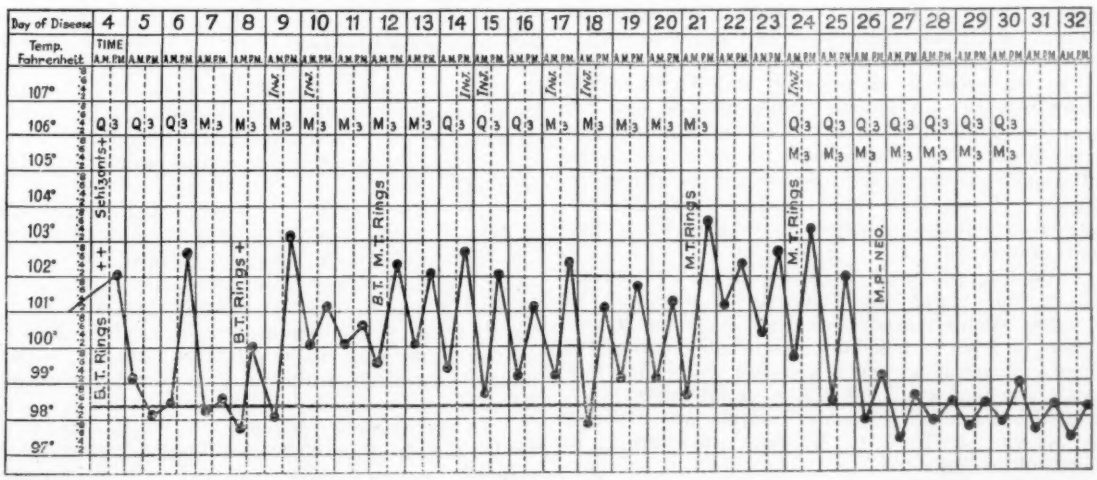
GRAPH 1—A case of M.T. malaria showing response to quinine treatment but relapse with mepacrine. Quinine controlled the attack again; although no relapse again occurred during the mepacrine course this time, relapse occurred very early during pamaquine administration. Quinine was definitely the more powerful of the two drugs in this case.



GRAPH 2—A case of B.T. malaria showing relapse on the third day of mepacrine treatment although there had been a very good response to quinine. He became comatose. The combined treatment took about 96 hours for the patient to come round completely.



GRAPH 3—A case of B.T. malaria showing very late response to treatment during the first antimalarial course, with relapse during the pamaquine period, although mepacrine was given for seven days instead of five. There was no response to two further routine antimalarial courses. Combined treatment was given when the patient became very ill, and adequate and early response was obtained.



GRAPH 4—A case of B.T. and M.T. malaria, showing no response to quinine or mepacrine. The patient developed early cerebral symptoms and combined treatment was instituted with complete response in 48 hours.

stopped, symptoms allowed to pass off, and the rest injected subsequently and usually much more easily. It was surprising how often, with these guides to control the rate of injection, quinine could be injected intravenously to severely collapsed cases, even those with gross organic heart disease and children as young as three years old. In a few cases where the risk was considered too great, collapse was first treated with fluids intravenously and the quinine added towards the end of the infusion.

The results of successful treatment suggest that immediate and best results of parenteral quinine are obtained by simultaneous intramuscular and intravenous administration. As after intravenous injection 90 per cent of the quinine leave the blood in 20 minutes (Harmann and Zila, 1918), and as the action of quinine rapidly absorbed from the tissues on the parasites in the circulation is almost instantaneous (Manson-Bahr, 1941), by this method a steady concentration of quinine is maintained in the blood stream. This object cannot be achieved by repeated intravenous injections of quinine as 90 per cent of it is so rapidly destroyed or fixed by the tissues on which it has a deleterious effect, *e.g.*, it was found when resistant strains were treated by repeated intravenous injections of quinine, there was deterioration of the patient's condition and in some myocarditis occurred. This object was, however achieved by a drip infusion of quinine at the rate of 10 grains in 8 hours, and no deleterious effects were observed.

No adrenaline was added to the quinine as restlessness, excitement, tachycardia are produced by both drugs and so the symptoms of quinine intolerance are masked by it. In a few it produced alarming symptoms which could have been wrongly ascribed to quinine. Restlessness, delirium, and acute manic symptoms are all increased by adrenaline.

Rapid wasting, toxaemia and its deleterious effects were combated by a generous diet. In the absence of vomiting when the patient was unable to swallow, a nasal feed consisting of milk pint 1, glucose oz. 2, vitamin B mg. 3, vitamin C mg. 100, and alkalies dr. 1 to 1½, was given four-hourly. Water was given between the feeds and depending on the season, 9 pints or more of fluid were administered in 24 hours. In cerebral cases, however, a systolic blood pressure 100 mm. of Hg. or below was taken as indication for intravenous glucose saline.

In the presence of vomiting and diarrhoea the patient was put on glucose saline infusion and the blood pressure maintained at 100 mm. of Hg. or above. 16 to 30 ounces of glucose were infused in 24 hours, and vitamins B and C and alkalies were added to the infusion.* In cases showing acidosis, immediate alkalinisation was obtained by infusing 150 c.c. of 4% sodium citrate solution.

Vomiting produced by irritation of the stomach by bile and toxins was relieved by alkalies. An automatic stomach wash, produced by giving a pint or more of 2 per cent sodium bicarbonate solution and subsequent vomiting, gave immense relief in other cases. Atropine gr. 1/50 was a useful adjunct. A useful drink retained by many patients was made as follows—glucose dr. 2 to 4, soda bicarb dr. 1, in a bottle of ice lemonade.

Obstinate vomiting of central origin responded best to sodium barbitonum gr. 15 or phenobarbitonum gr. 1, repeated in 4 hours if necessary. Relief followed lumbar puncture in many cases.

The worst vomiting encountered in gastric cases did not show any response to sedatives like adrenaline chloride, tincture of iodine, and hydrocyanic acid. Sodium barbitonum, phenobarbitonum, and atropine diminished the tendency. These drugs were also useful in cases of quinine intolerance.

Calcium gluconate, 20 c.c. of a 10 per cent solution intravenously, repeated in 2 to 4 hours if necessary, checked vomiting in renal acidosis or in alkalosis, conditions in which there is a fall in the ionised calcium content of blood.

In algid cases eucortone acted as a specific.

Diarrhoea in dysenteric and choleraic cases was treated with sulphapyridine, and in the majority of cases antimalarial treatment was held in abeyance till the course of sulphapyridine was completed; as a routine 4 tablets were given stat with chlorodyne m. 60, and 2 tablets were repeated 4 hourly for 4 days with adequate quantities of alkalies and water. The diet did not require any rigid control, milk was tolerated by the majority from the beginning, and the patients rapidly took to their normal meals. Complete relief was usually obtained within 48 hours as the stools rapidly controlled and constipation sometimes obstinate became the rule. Routine anti-malarial treatment was given after the course of sulphapyridine was finished.

Normal saline 4 to 6 pints, depending on the degree of dehydration was rapidly infused in 30 to 45 minutes. Atropine gr. 1/50 was added to the infusion to prevent any tendency towards œdema of the lungs. Drip infusions were continued as long as necessary. Infusion with normal saline yielded excellent results. It was found that peripheral circulatory failure may set in with marked rapidity in dehydration, and so rapid infusion to begin with was the method of choice. With hypertonic saline however it was found difficult to infuse adequate amounts of fluid without causing circulatory embarassment. In some cases changes in the R.B.Cs. were inevitable, as apparently the dehydrated tissues could not supply water for its dilution. Hypertonic saline when used, was therefore deferred till adequate quantities of normal saline had been infused.

Threatened anuria or anuria was treated with 4·285% sodium sulphate solution 1 to 2 pints, with the addition of vitamin C mg. 500-1000, and 100-200 c.c. of 25% glucose to accentuate its effect. Sulphapyridine exerted a specific effect if the diarrhœa was due to bacillary infection. Emetine gr. 1 was given daily for 12 days along with the antimalarial treatment, without any adverse effects, if the diarrhœa was due to amœbic infection.

In convulsions sodium pentothal was found to be the drug of choice, as convulsions could be controlled within a few seconds and so their deleterious effects easily checked. Grains 7½ was given at first sitting, and in a few cases it was repeated where convulsions recurred after the effect of the drug passed off. Quinine is incompatible with sodium pentothal and forms a white curdy precipitate with it. As the control of convulsions was found more important than the injection of intravenous quinine, the administration of the latter was deferred for half an hour, when it

* The author has used vitamin C combined with alkalies both during oral and intravenous therapy. The rationale of such a combination may be questioned on the fact that alkalies destroy vitamin C when they are administered simultaneously in combination—*Editor.*

could be safely given. Intramuscular quinine and mepacrine were however given at once. Lumbar puncture was done in all cases and as much cerebrospinal fluid was withdrawn as would flow under its own pressure. It was repeated if necessary.

Restlessness, delirium, and acute manic symptoms were treated with sodium pentothal intravenously, followed if necessary by sodium barbitonum gr. 15, or phenobarbitonum gr. 1, or soneryl 2 to 4 tablets. Not more than 1 to 2 doses were necessary at 4 hourly intervals.

For hyperpyrexia the patient was laid on a wet bedsheet spread on a bed under a fan and covered with another wet bedsheet, both of which were kept wet by sprinkling water over them. Under the sheet the patient was actually in a cold chamber, and left there till there was no tendency for the temperature to rise. In severe cases the perineum, groins, axillae, and head and neck were packed in ice as adjuncts to lower the temperature quickly. Using this method a large number of patients were treated with the minimum staff. Aspirin and alkalies were used as antipyretics without any adverse effects. Patients *in extremis* were revived with coramine 5 c.c. intravenously, artificial respiration, and every thing to lower the temperature quickly.

The algid type was tided over by infusions of glucose saline with suprarenal cortical extract added to them. 30 c.c. were given 6 hourly till improvement set in.

Blackwater fever was treated with antivenine (Singh and Singh, 1944). Hæmolysis in acute hæmolytic anæmia, and hæmorrhages in purpuric cases, were also successfully combated with antivenene.

Abdominal pain, headache, and giddiness sometimes caused by mepacrine were allayed with alkalies. There was no need to stop the drug. In one case however abdominal pain recurred with each dose of the drug which had to be discontinued, as sedatives were useless.

Lobar pneumonia complicating malaria was treated with sulphapyridine, 4 tablets stat, and 2 tablets 4 hourly for 4 days with adequate quantities of alkalies and water. Antimalarial treatment was given after the course of sulphapyridine was finished.

Peripheral circulatory failure. Excellent results were obtained in some cases with infusions of plasma when glucose saline failed. Coramine c.c. 3, pituitrin c.c. 1, atropine gr. 1/50, and suprarenal extract c.c. 30, four hourly were added to the infusions. Strychnine gr. 1/30 was given hourly till its full effect on muscles was obtained. Vitamin C mg. 100-200 was given four hourly by mouth.

Results

510 cases of pernicious and resistant forms of malaria were treated with 12 mortalities. Death occurred in a cerebral attack in 4 cases, 3 of which proved resistant to quinine and 1 to mepacrine. A cerebral case with tetanic convulsions and acute manic symptoms died within six hours of admission, and postmortem showed positive B. T. and M. T. in smears from brain, spleen, and bone marrow. A comatose cerebral case due to M. T. infection, after recovering developed head retraction, frequent vomiting, convulsions, and bilateral paralysis with extensor plantar response on the fourth day and died; autopsy showed extensive thrombosis of the sagittal sinus, and smears from brain, spleen, and bone marrow were negative. A paraplegic case due to M. T. infection, after recovering in 48 hours, developed lobar pneumonia and died of pneumococcal septicæmia on the fourth day; postmortem smears from brain, spleen, and bone marrow were negative. In one case malaria was associated with acute yellow atrophy of the liver, but it is difficult to assess the relationship. Four cases of malaria and lobar pneumonia died of lobar pneumonia.

The mortality was as follows:—All cases—2·3%, Cerebral cases—3·06%, malaria with lobar pneumonia —5·33%.

With the combined treatment no relapse was recorded during the course of the treatment, or during 6 to 8 weeks of convalescence, except in one case where a relapse occurred 12 days after the completion of treatment.

Conclusions

(1) Combination of quinine gr. 10 and mepacrine gm. 0·1, t.d.s., is the most potent therapeutic agent against virulent and resistant strains of malarial parasites.

(2) Sulphapyridine exerts a definite effect on malarial parasites. Therefore when malaria is complicated by pneumonia and/or bacillary dysentery, the treatment of malaria can be held in abeyance in the majority of cases till the course of sulphapyridine is completed. Combination of quinine and sulphapyridine sometimes gives rise to toxic and adverse symptoms, which can be wrongly ascribed to the disease. Combination of mepacrine and sulphapyridine is quite safe.

(3) A generous diet with a high caloric value during the course of acute illness is an important factor in the successful treatment of pernicious and resistant cases. Milk pints 6, eggs 12, glucose oz. 12, marmite oz. 3 or Vitamin B mg. 18, and Vitamin C mg. 600, with a caloric value of 4,000 is advocated. Where diarrhœa and vomiting preclude its use, glucose 16-20 oz. with a caloric value of 2,000-2,500 may be infused intravenously in 4 hours.

(4) The following drugs are very useful in symptomatic treatment: (*a*) Infusions of plasma in peripheral circulatory failure. (*b*) Sodium pentothal in convulsions. (*c*) Suprarenal cortical extract in algid cases. (*d*) Antivenine in acute hæmolytic anæmia and blackwater fever and in hæmorrhagic forms.

Acknowledgment—We wish to thank Dr. Devinder Singh for collaboration in the treatment of 28 cases.

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MENSTRUAL DISORDERS*

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Ancient Concepts

The function of menstruation has exercised the imagination of human beings since the earliest times. Its causation and significance have been a constant source of mystery and speculation. At one time menstruation was considered to be due to the influence of the moon because of its cyclical occurrence.

Since the earliest times menstruation has been regarded as a form of purification. Impurities present in the body are believed to be discarded in the menstrual blood. The belief that the menses are a form of purification led to the conclusion that menstruating women are unclean, and hence they should be segregated. Everything a menstruating woman touches is therefore unclean. This custom is still prevalent amongst orthodox Hindus. Hippocrates and Aristotle supported the theory that menstruation is meant for the purification of women.

It was also believed that menstrual blood is necessary for the nourishment of the embryo. It used to be thought that when conception occurs menstrual flow ceases because the menstrual blood combines with the seed of the male to form the embryo.

With the advent of the 19th century these superstitions gave place to more exact scientific knowledge. The importance of ovaries and their relation to menstruation came to be realised gradually. Thus Percival Pott removed, by mistake, the ovaries of a young woman and noted that the menstrual periods, previously normal and regular, ceased for ever. Knowledge came gradually with experiments on animals, and with the histological study of the endometrium and Graafian follicles in women. The classical description of Hitschmann and Adler of the cyclical changes in the endometrium during the menstrual cycle appeared in 1908, and our present knowledge of the physiology of menstruation has been based upon the research of a number of workers during the last 50 years.

Physiology of the Menstrual Cycle

Anterior pituitary is the master gland which controls and regulates, *via* the ovaries, the cyclical changes of menstruation. Whether anterior pituitary is controlled by a centre in the hypothalamus or elsewhere in the brain is a moot point. There is considerable evidence, however, that the anterior pituitary is under the control of a nerve centre.

The anterior pituitary secretes two gonadotropic hormones called prolan A or follicles-stimulating hormone, and prolan B or luteinising hormone. Prolan A produces ripening of the Graafian follicles, and prolan B brings about development of the corpus luteum from the ruptured Graaffian follicles. Rupture of the ripe Graaffian follicle and liberation of the ovum *i.e.,* ovulation, seems to be brought about by a combination of the two hormones in certain proportions. Thus the anterior pituitary controls completely the functioning of the ovaries.

The ripening Graaffian follicles secrete the hormone, œstrogen. The corpus luteum, although it also produces œstrogen, elaborates its own characteristic hormone, progesterone. These two ovarian hormones, œstrogen and progesterone, bring about the cyclical changes in the endometrium, which constitute the menstrual cycle.

The menstrual cycle can be divided into: (1) the proliferative phase, (2) the secretory phase and (3) the menstrual phase.

The proliferative phase is due to the action of œstrogen and starts as soon as menstruation has ceased, and continues till the time of ovulation. During this phase regeneration of the endometrium occurs, and towards the end of the phase the endometrium is thick with numerous glands lined by columnar cells.

With ovulation the proliferative or œstrogen phase ends and the next, secretory or progestational phase begins. There has been a great controversy for the last few years regarding the exact time of ovulation in women, but to-day the consensus of opinion is that ovulation occurs about 15 days prior to the expected flow, regardless of the length of the menstrual cycle.

Following ovulation, the secretory phase begins. The ruptured Graafian follicle becomes converted into the corpus luteum, which secretes both œstrogen and progesterone. The secretory phase is due to the combined and finely balanced action of these two hormones. The whole endometrium becomes thick and vascular, and can be differentiated into compact, spongy and basal layers. The glands becomes tortuous, distended with secretion and lie in close proximity. Between the glands the stroma cells resemble the decidua cells of pregnancy.

This secretory phase of the endometrium is a preparation for the embedding of the ovum if it becomes fertilized. If the ovum, liberated at ovulation, does not become fertilized, the corpus luteum degenerates and menstruation ensues about 15 days after the ovulation.

The menstruating phase is attended by disintegration and exfoliation of the endometrium, only its basal layer remaining. Although the menstrual discharge is composed chiefly of blood, it also contains mucus, fragments of disintegrating endometrium and desquamated vaginal epithelium. One peculiar characteristic of the menstrual blood is that it does not clot. There is no dearth of theories to explain this characteristic, but the real explanation remains obscure.

Such in brief is the present day view of the basic endocrine mechanism of menstruation. However there are many gaps and guesses in our knowledge. There are other endocrine glands—the suprarenal and the thyroid notably which have something to do with the normal menstrual cycle, though we do not know the exact relationship. What exactly brings about menstruation and bleeding is another puzzling problem. The theories that menstruation and bleeding are due to (1) withdrawal of œstrogen, or (2) withdrawal of progesterone, or (3) some change in the proportions of the two, are all inadequate. Some workers, notably

* Read at the 7th Maharastra and Karnatak Provincial Medical Conference, Sholapur, Dec., 1944.

Zondek, have therefore postulated the existence of an endometrial bleeding factor. This hypothetical bleeding factor is believed to be produced in the uterine mucosa itself, but can act only after the endometrium has been first prepared by œstrogen. It is supposed to be a powerful vasoconstrictor, and therefore it produces spasm of the spiral arterioles of the endometrium, and anoxæmia, necrosis and bleeding.

Amenorrhoea

Normally menstruation commences at the age of 12 to 14 years. However in many otherwise normal girls the onset of menstruation is delayed to the age of 17 or 18. This often appears to be a family characteristic and no treatment is indicated. If menstruation has not commenced by the age of 18 years, the case must be investigated. Absence of menstruation may be due to absence of uterus or a rudimentary uterus, for which no treatment is feasible. In many cases the onset of menstruation is delayed due to an underdeveloped condition of the uterus. In these cases much can be done by endocrine treatment to make the uterus develop normally. Oestrogens must be given in sufficiently large doses such as 5 mgm. or 50,000 I.B.U. by intramuscular injection twice a week for 2 weeks and repeated after two weeks' interval.

Secondary amenorrhœa—This is far more common than primary amenorrhœa. When confronted with a case of secondary amenorrhœa, one must first remember and exclude its physiological causes such as pregnancy, lactation and menopause. Pregnancy is the commonest cause of amenorrhœa in the childbearing age. If a woman who has been previously menstruating regularly misses her periods, then the most probable cause is pregnancy. Lactation may be responsible for amenorrhœa for one or even two years after childbirth because many women, either due to ignorance or poverty, continue to nurse their babies for 1 to 2 or more years. Such prolonged lactation causes superinvolution of the uterus and amenorrhœa. Menopause may come on prematurely at the age of 40 years or earlier and cause amenorrhœa at an earlier age than usual.

Pathological amenorrhœa—Normal menstruation is dependent upon the harmonious activity of the three inter-related factors *viz.*, the anterior pituitary, the ovaries and the uterus. Amenorrhœa may be caused by the malfunctioning of any one of these inter-dependent links; or a disturbance of nonendocrine origin may indirectly cause amenorrhœa through inhibition of the anterior pituitary or the ovaries.

Acute infections, prolonged suppuration, anæmias, incipient pulmonary tuberculosis may all cause amenorrhœa. Physical or mental shocks, fear of pregnancy or even great anxiety for pregnancy, mental disorders, change of climate, change of occupation—all these may cause amenorrhœa possibly through the action of higher nerve centres on the anterior pituitary.

Thus when we see a case of amenorrhœa it is necessary to take a detailed history and perform a thorough medical examination lest we should miss one of the above causes of amenorrhœa.

Amenorrhœa of pituitary origin—Many cases of amenorrhœa are due to a functional derangement of the ant. pituitary of unknown aetiology. In these cases there is a characteristic obesity in the lower abdomen, gluteal regions, upper portions of thighs, shoulders and breasts. There is also hypertrichosis. The treatment of these cases is difficult for as yet we do not have potent extracts of the ant. pituitary for treatment. Results with anterior pituitary like extracts from pregnancy urine or pregnant mare's serum have been disappointing. Very recently a combination of chorionic gonadotropin and pituitary follicle stimulating hormone has been put on the market under the name of "Synapoidin". Its dose is 1 c.c., I.M., 3 times a week, for 3 weeks. To date best results in amenorrhœa of pituitary origin have been obtained with this preparation, apart from stimulating doses of x-rays.

Amenorrhœa of ovarian origin—Amenorrhœa due to ovarian lesions is rare, for menstruation can occur even when a small portion of one ovary is functioning. If both ovaries have been removed or destroyed by x-rays or radium, amenorrhœa will naturally occur. Arrhenoblastoma of the ovary will cause amenorrhœa and masculinizing features due to excessive production of androgens.

Amenorrhœa of uterine origin—The uterine mucosa must respond to the ovarian hormones for menstruation to occur normally. This is a very important but very often forgotten fact. I have at present under my care a patient aged 22 years who has prolonged amenorrhœa. On physical examination nothing abnormal is found and the uterus is of normal size. There is no hirsutism and no obesity. Administration of 50 mgm. of clinestrol and 10 mgm. of progesterone has failed to bring even a semblance of menstrual bleeding. I think the cause is that the uterus does not respond to the hormones.

Lastly amenorrhœa may occur in thyroid disturbances, both in hyperthyroidism and hypothyroidism.

Adrenal tumours and adrenal cortical hyperplasia will cause amenorrhœa, hirsutism and other masculine features.

Treament of amenorrhœa—Amenorrhœa is a symptom due to many causes as we have seen above. In many cases no cause can be found. We may treat such patients with œstrogen 5 mgm. twice a week intramuscularly for 2 weeks, followed by progesterone 5 mgm. twice a week for the next 2 weeks. This may be continued till menstruation occurs. Once in a while menstrual rhythm may become spontaneously re-established as a result of this treatment. In the majority of cases production of menstrual bleeding on an occasion or two by this treatment is of no value, except for the psychological benefit of the patient. It is also very costly. If the patient is also suffering from sterility, this treatment or any endocrine treatment at our disposal so far, is valueless. For even though it may produce menstruation, it cannot cause ovulation. Without ovulation conception is, of course, impossible.

Some workers have reported good results in the treatment of amenorrhœa by low dosage irradiation of the anterior pituitary and of the ovaries.

Irregular Periods

It is now definitely established that the regular cycle of 28 days is a myth. Many workers have kept exact records of the menstrual periods of hundreds of women for several years, and they did not find a single woman who always had her menstruation exactly after the same length of time. There are thousands of women who would assert that their menstruation occur with unchangeable regularity but if exact records are kept over a period of one year, it will be impossible to find such a woman. Therefore slight irregularities are normal. Many a woman comes for treatment because her periods are a few days too early or too late. Such patients do not need endocrines but explanation and reassurance. If however the periods are delayed and scanty the same treatment may be given as for secondary amenorrhœa.

Dysmenorrhoea

In only about 15% of women the menstrual function is absolutely painless. In 85% of women there is varying degree of discomfort during menstruation. When the discomfort is severe enough to interfere with the patient's work and incapacitate her from daily activities, the condition is designated as dysmenorrhœa.

Primary or spasmodic dysmenorrhœa may be present from the commencement of menstruation but most commonly patients come for treatment at about the age of 20 or 22 years. Primary dysmenorrhœa is still the bugbear of endocrine gynæcology. The pain is believed to be due to disordered and spasmodic contraction of the uterine muscle either due to hypoplasia of the uterus or due to imbalance of œstrogen and progesterone.

Treatment of Primary Dysmenorrhoea—Mental and bodily fitness comes first. The most important thing to do is to build up the patient's general health, and to break her 'habit' of menstrual pain. For the former fresh air, good food, vitamins, and exercises are the most important. It is difficult to make the girls take to physical exercise, but its importance cannot be exaggerated to breach the 'habit' of menstrual pain; any idea of invalidism should be avoided, for the psychoneurotic factor plays a large part in the genesis of dysmenorrhœa. The patient should be told that menstruation is not necessarily a painful function, and that she should keep herself occupied and be up and about doing her work during the periods rather than take rest in bed.

Drugs—Drugs are often used to relieve the pain as a temporary measure while treatment on general lines is being established. Aspirin, phenacetin and codein; Luminal ½ gr.; Atropine 1/100 gr.; Belladenal, and Benzedrine sulphate gr. V are some of the drugs used.

Hormones—If the uterus is under-developed œstrogens are given in the first fortnight and progesterone in the last week before menstruation. If the uterus is of normal size, progesterone alone in a dosage of 2-5 mgm. is given I.M. for 3 days immediately preceding menstruation. Results with progesterone are disappointing; and recently, gratifying results have been obtained with testosterone propionate 10 mgm. twice a week.

Operation—Dilatation of the cervix is a minor surgical procedure and will cure 60 to 70% of cases. Dilatation cures the patient either by rupturing the nerve fibres surrounding the internal os or by reflexly stimulating the pituitary-ovary mechanism. There then remain a very few cases of dysemenorrhœa which are unrelieved by the above treatment, and which suffer severely enough to require the abdominal operation. They can be cured by presacral sympathectomy. The number of patients in whom presacral neurectomy is justified is small indeed.

Backache

It may not be irrelevant to refer to the subject of backache in women here. Backache is so common in women that a cynic has described a woman as a constipated biped with a backache. Be that as it may, I want to refer here to the unimportance of gynæcological lesions in the causation of backache. In my experience, in the majority of cases of backache the cause is fatigue, or faulty posture, or sacroiliac strain, or a neurosis. First and foremost backache is a symptom of general fatigue, and the woman who is overworked, under nourished and insufficiently rested is the one most likely to suffer from it.

Backache is in great many cases a psychoneurotic symptom. On further questioning these women will also found to be suffering from palpitations, headache, indigestion, 'gas', giddiness and what not. If retroversion of the uterus is found in a woman complaining of all these symptoms, it is best to leave it alone. Some decades back there was a mania for pessaries, and today there is mania for ventral suspension operations. In the majority of cases these are unnecessary; for, correcting small departures from the ideal in the position of the uterus, is not going to cure a patient of neurosis.

Many patients with backache are really in need of feeding up or physical exercises or psychiatric treatment.

The gynæcological lesions which do cause backache, such as endometriosis, also have other prominent signs and symptoms, which in themselves call for treatment.

Uterine Bleeding

It is not sufficient to simply label a case of uterine bleeding as one of menorrhagia, metrorrhagia, menometrorrhagia etc. It is necessary to perform a thorough systemic examination, bimanual examination and a speculum examination to determine if the bleeding is due to (1) constitutional causes such as purpura, or (2) local organic lesions such as fibroids or carcinoma, or (3) complications of pregnancy such as abortions.

If no cause is found the case is one of (4) functional uterine hæmorrhage, or some call it dysfunctional uterine hæmorrhage.

Functional uterine hæmorrhage is due to endocrine imbalance and constitutes a most fascinating chapter in gynæcological endocrinology. When the hæmorrhage occurs after a period of amenorrhœa of 2 or

3 months and continues for a long time it is also called metropathia hæmorrhagica.

Dysfunctional uterine hæmorrhage may occur at any age—at puberty, during the childbearing age or near menopause. It may also occur from any type of endometrium—proliferative, hyperplastic, secretory or even atrophic. Hence a simple explanation that the bleeding is due to excess of œstrogen or deficiency of progesterone is inadequate; and one takes refuge behind the theory that the bleeding is due to malfunction of the endometrial bleeding factor; though it neither helps us nor the patient.

Treatment of dysfunctional uterine hæmorrhage—(1) The first principle is to rule out systemic and local conditions. A blood examination may be necessary to rule out purpura. A bimanual examination, speculum examination, biopsy and curettage may all be necessary to rule out local lesions.

(2) Drugs—Calc. lact. gr. XX, or ergometrine 0·5 mgm. tablets, or neogynergen tablets may be tried in milder cases. Vitamins C and K, and snake venom are also worth trying.

(3) Hormones—Hormonal treatment though costly, has its greatest usefulness in the treatment of young girls; for these cases other lines of treatment such as operations or irradiation are undesirable, and spontaneous readjustment of hormones and cessation of bleeding is likely after a few months.

(*a*) Progesterone 5 mgm. I.M. daily until bleeding stops, and in the week preceding the anticipated onset of menstruation. It is costly and often unsuccessful.

(*b*) Antuitrin S. This is a chorionic gonadotropin prepared from pregnancy urine. 1 to 2 c.c. are given 2 to 3 times a week for 2 to 3 months. It is useful in puberty bleeding.

(*c*) Thyroid ½ gr. twice a day by mouth helps in many cases because marked hypothyroidism is present.

(*d*) Oestrogens are not indicated though some people do give them.

(*e*) Pituitrin is valueless in gynæcological bleeding.

(*f*) Testosterone propionate. Very successful results are obtained with this hormone. 25 mgm. are given I.M. twice a week. The total dosage in a month should not exceed 300 mgs. because of the risk of masculinisation.

(4) Curettage—Except in puberty cases curettage should be done in all cases to exclude a small submucous fibroid, mucous polypus or fundal malignancy. Curettage suffices as a temporary measure in many cases. Recurrences are prevented by hormonal treatment or radium. Blood transfusion from a male donor may control bleeding and prevent recurrences.

(6) Radium—Intrauterine application of 50 mgm. of radium for 8 hours may be used in younger women to produce temporary amenorrhœa. The risk of producing permanent amenorrhœa or of damaging the future offspring is very slight. In women about 40 years of age, 50 mgm. for 36 hours would produce menopause. When the bleeding is severe or troublesome and the patient is a risky subject for operation, irradiation would be the method of choice.

(7) Hysterectomy may be necessary especially in women above 40.

Menopause

I would like to refer to two points in connection with the treatment of menopausal symptoms.

1. For the relief of menopausal symptoms it is best to give large doses of œstrogens first and, when the symptoms have been controlled, to diminish the dose gradually. At first 5 mgm. of ovocyclin P or clinestrol may be given by injection twice a week. The dose is then gradually reduced so that the patient becomes used to small quantities of œstrogen and no symptoms appear. Finally stilboestrol may be given by mouth in a dosage of 1 mgm. As a rule treatment is not necessary for more then 4 to 6 months.

2. All symptoms occurring at menopause are not necessarily due to menopause. Patient may be suffering from medical diseases such as high blood pressure. If there is any irregular vaginal bleeding or postmenopausal bleeding, malignancy must be ruled out at once. In other words a thorough examination precedes the treatment of supposed menopausal symptoms.

Summary

Ancient concepts of menstruation, its modern physiology, and the ætiology and treatment of amenorrhœa, dysmenorrhœa and backache, dysfunctional uterine hæmorrhage and menopause have been reviewed.

(*Continued from page 112*)

test tubes were used. The reaction on the slide appeared within 15 minutes. In most cases of 1 in 15 dilution of the serum gave a good reaction.

The Importance of the Finding

The effect of this abnormal haemagglutinin on the fœtus is not yet known. The mother is almost certain to come to harm if transfused with whole blood from any donor.

The fact that no anti-Rh serum has yet been obtained from 258 expectant mothers in Calcutta, while 1 serum was obtained from 61 expectant mothers in Dublin (Dockery & Sach, *loc. cit.*) is not significant for the following reasons:—

(1) Only 1 in 25 or 50 Rh— women is readily sensitized (Wiener, 1945, *a*).

(2) The complication due to Rh incompatibility arises in less than 1 in 300 pregnancies in America (Wiener, 1945, *c*).

(3) The Rh— rate in America, which gives rise to less than 1 complication in 300, is 15 per cent. In Calcutta this rate presumably lies between 7 and 10 per cent. Half the rate will give rise to less than 1 complecation in 600 pregnancies.

Incidentally the Rh— rate of 'Asiatic Indians' (Punjabee Muslims, in this instance), has been recently given as 7·1 (Wiener 1945, *b*).

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INTRA GROUP REACTION IN AN Rh-EXPECTANT MOTHER & ASSOCIATED CONSIDERATIONS

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A Case Report

The expectant mother .Mrs. R. D. a Bengalee Hindu aged 23, from Howrah, 7 months advanced in her second pregnancy, belonged to group 0 and was Rh negative (briefly, the subject was ORH—). Her red blood croupuscles (rbc hereafter) were of course not agglutinated by known serum a (α not necessary) or serum b (β not necessary) and her serum agglutinated, as expected, known rbc A and rbc B. Her husband was BRh+ and a son aged 5 was ORh+.

The serum of the expectant mother, however, agglutinated rbc 0 from 41 consecutive subjects 0 including 2 ORh—. The hæmagglutinin responsible for the reaction, therefore, was not the anti-Rh body.

Other workers examining routinely pregnant women bloods for anti-Rh body have described similar sera which, however, agglutinated only 'most of the 0 corpuscles' (Dockeray & Sachs, 1943).

The general condition of the case was good. There was no history of abortions between the last delivery which was also the first delivery and the present pregnancy. The case is 1 of 258 tested routinely from the Eden Hospital through the courtesy of Col. Murray, I.M.S. While several weak intra group reactions have been found in Rh+ expectant mothers the reaction under report is the only strong reaction and has been found in an Rh-case.

The Technique of Haemagglutination

For the rbc of the expectant mother, for Rh+/— state, both slides and tubes were used. The slide technique has been described in details previously (Greval & Roy Chowdhury, 1943). The tube technique, briefly, was this: In an ordinary test tube 4"×½", such as is used for complement fixation, 4 drops (each drop measuring 0·02 c.c.) of 2 per cent rbc suspension were mixed with 4 drops of rabbit anti-Rh serum in a 1 in 200 dilution (The serum in this dilution gave an Rh— rate of 7·85 per cent in a series of 400 cases). The tube was shaken, left in an incubator for 2 hours and examined over the concave mirror of a microscope (Gallagher & Jones, 1943). For confirmation the test was repeated with a standard human anti Rh serum of the Galton Laboratory Serum Unit, Cambridge, giving an Rh- rate of 15 per cent in England.

For the reaction of the rbc of the 41 subjects 0 with the serum of the expectant mother both slides and

(Continued at foot of col. 2, page 111)

The enquiry into the Rh hæm(agglutin)ogen undertaken in this laboratory is partly financed by the Indian Research Fund Association.

ACUTE MASTOIDITIS*

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Ballenger thinks it probable that in nearly every case of acute infection of the middle ear, the mastoid cells and the antrum are also involved. The antrum is the axial centre, mastoid cells communicating with it behind and the middle ear anteriorly, through the aditus and epitympanic recess. He finds it difficult to separate the suppurative processes of the middle ear from those of the mastoid cells, although admitting that clinically, a subdivision is possible although upon an arbitrary basis according to the focal manifestations. To my mind, there is yet another reason, why the suppuration of the mastoid cells should be regarded as a separate entity, notwithstanding its intimates relation to the suppuration of the middle ear. This will be obvious by a little consideration of the development of the two cavities.

The paryngo-tympanic tube and the tympanum are developed from a recess between the first and the third visceral arches,—termed the tubo-tympanic recess, floor of which consists of the first and the second visceral arches and the first and second pharyngeal pouches. This recess lies on the antero-lateral aspect of the ear capsule. During the sixth and seventh month, the typmpanic antrum appears as a dorsal expansion of the tympanic cavity. These subsequently become included in the petrous portion of the temporal bone by a cartilaginous process growing from the lateral aspect of the ear capsule.

About the same time a separate centre of ossification (epiotic) appears in the cartilaginous ear capsule near the posterior semi-circular duct (canal) and extends to form the mastoid process. This mastoid portion at birth is flat, and probably devoid of any cells, lies immediately behind the tympanic cavity. With the development of mastoid air cells, the lateral portion of the mastoid portion grows downwards and forwards to form the true mastoid process, so that the styloid process and the stylo-mastoid foramen now come to lie on the under surface of it.

It is not until the latter part of the second year that the mastoid process forms a definite elevation on the surface of the skull and this growth continues with the growth of the infantile skull till the seventh year. It will be appreciated from the above description, that the antrum, or the so called mastoid antrum, is not a big mastoid cell but rather an extension from the posterior end of the tympanic cavity, which later becomes surrounded and appropriated by mastoid cells, and that long before even a rudimentary mastoid is present, the antrum is an easily demonstrable cavity.

It would therefore appear neither rational nor advantageous to regard the process of extension of suppuration of the middle ear to mastoid as one disease,

* Read at the Maharastra and Karnatak Provincial Medical Conference, Sholapur on 15th-17th December, 1944.

and according to focal manifestations, a sub-division being possible, should be made. The term is here applied to cases of mastoiditis where some obvious and definite indication of mastoid osteitis exists.

Frequency

The following table gives the frequency of acute mastoiditis:

Incidence of Acute Mastoiditis

Time	*Acute Suppurative otitis media*	*Mastoiditis*	
9 months	.. 223	11	
27 months	.. 881	41	
Total	.. 1104	52	5·1 per cent.

Etiology

Acute mastoiditis is practically always secondary to a suppurative lesion of the middle ear. Primary mastoiditis from syphilitic and tubercular infection is possible but rarely seen in practice. Traumatic mastoiditis is the rarest. Cases have been reported from time to time in which the drum membrane has presented no signs of inflammation and yet giving rise to mastoid disease, primary mastoiditis—organisms isolated being pneumococcus III, Streptococcus mucosa capsulatus of Schottmuller.

Symptoms and Signs

When free drainage is interfered with, mastoid symptoms become manifest. The symptoms are largely those of pressure from retention of the secretions within the cells. They are pain, redness, swelling, tenderness upon pressure over the mastoid, and fever due to the suppuration. The symptoms vary greatly in severity according to the type of mastoid bone present.

Three types of structurally different mastoid processes are recognised.

1. The Pneumatic or Cellular type—The bone is honey-combed by air cells. Each air-cell is lined with mucous membrane which is continuous with the lining of the rest of the middle ear cleft. These pneumatisations may extend beyond the mastoid process. There is great variation in the size and distribution with the liability of symptoms peculiar to each (*i*) cells along posterior meatal wall, when infected there may be periostitis of the meatus with bulging of its posterior wall; (*ii*) cells along the tip of the mastoid process,—Bezold's mastoiditis; (*iii*) in the tegmen antri—with liability to an extradural abscess; (*iv*) cells along the groove of the lateral sinus—lateral sinustitis; (*v*) tracking forward in the zygoma with œdema of the front of the auricle; (*vi*) tip of the petrous bone-involvement of abducent nerve and external rectus paralysis, lastly (*vii*) along bony part of the auditory tube with liability to abscess formation on the lateral wall of the pharynx.

2. Diploic or cancellous type, in which the interior of the bone is filled with cancellous tissue consisting of spongy substance offering only moderate resistance to the curette. There is less tendency for the infection to spread rapidly, but when infection does develop, the signs appear late and, in consequence, operation is often dangerously delayed.

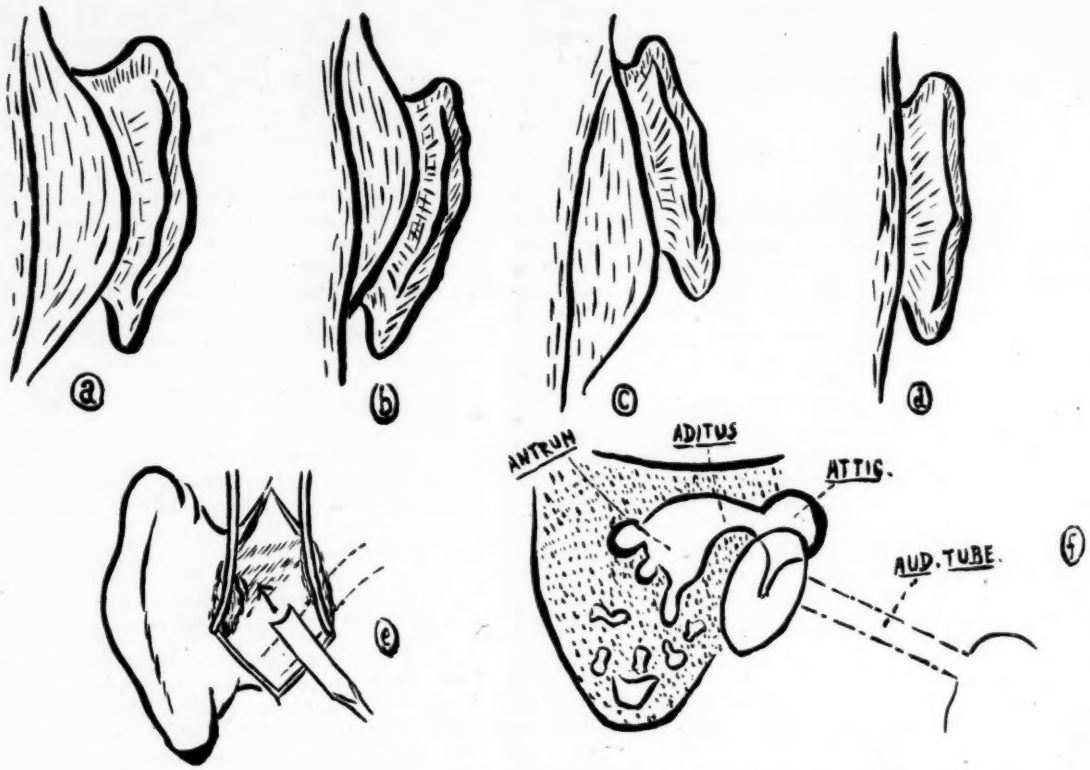
3. *Sclerotic* type, the bone is dense and of ivory hardness. This type is most often found in operations for chronic suppurative otitis media. The sclerosis is not always a result of chronic suppuration, but is congenital in origin. Spread of infection is limited by the dense bone, and consequently it is unusual to find the classical signs of mastoiditis. Intracranial complications are more common, because the pus has difficulty in penetrating to the surface through the overlying bone, but can more easily traverse the thin walls separating the antrum from the dura mater of the middle and posterior cranial fossæ. If the patient's condition fails to improve after free discharge is established, either as a result of myringotomy or spontaneous rupture of the drum membrane, a rise in the evening temperature, earache, sleeplessness, poor appetite, and headache, suggests an infection of the mastoid process.

Pain—I attribute greatest importance to this symptom, aural pain and pain in the head or headache which may have been present since the beginning of the middle ear infection, may have become less intense, but they will be there if mastoiditis has supervened. It is deep inside the ear, may be throbbing, shooting or boring in character. It may be worse at night. So that I look for another symptom associated with pain, and that is sleeplessness. The headache may be present round about the ear, in the temporal, or occipital region. Some patients bear pain better than others and may deny the existence of pain but the pain being there and being worse at night sleep is lost. Obviously the patient is able to bear pain but cannot sleep.

Temperature which has settled down, may rise up to 100°F in the evening.

Tenderness—Is not of much significance. It may be present in severe infection of the middle ear without mastoid involvement. In the cancellous type it is all over the mastoid, tip tenderness suggest pneumatic type. In the sclerotic it is late to appear. To avoid confusion from tenderness due to furunculosis, the pressure should be applied without disturbing the auricle.

Swelling—The more constant and earlier swelling is at the deepest part of auditory meatus, causing a 'sagging' of the postero-superior canal wall, when seen through the otoscope. It is due to the periostitis and spreading inflammation of the lateral wall of the antrum. Later as the inflammation spreads towards the mastoid cortex, thickening of the soft structures and œdema over the bone increases. The retro-auricular groove is obliterated and the auricle is displaced outwards and downwards. Finally a subperiosteal abscess is formed.



(*a*) Abscess mastoid cortex with displacement outwards. (*b*) Abscess antrum wall with displacement outwards and downwards. (*c*) Bezold's mastoditis with displacement upwards. (*d*) Normal ear (no displacement). (*e*) Exposure of operation area: Posterior root zygoma. Suprameatal spine. Arrow towards aditus. Posterior wall auditory canal. Position lateral sinus. (*f*) Middle ear cleft—extends from nasopharynx to auditory tube, tympanum, through aditus, to antrum and mastoid cells.

It is to be pointed out that this classical sign may be late in appearing in sclerotic mastoid.

Amongst other signs and symptoms, mention must be made of a transient vertigo, involvement of the facial and abducent nerves, and atypical swellings depending on the distribution of the cells through the temporal bone, as have been alluded to above, *e.g.*, Bezold's.

Diagnosis

Continued pain, sleeplessness, discharge and presence of swelling as described are the symptoms from which the diagnosis of acute mastoiditis is made. X-ray picture of the mastoid is of value. It reveals the progress of the disease and the structure of the mastoid to be met with at the operation. During the stage of infiltration and engorgement, a haze or slight blurring of the cells will be visible. In the suppurative stage the shadow is more definite and there will be some destruction of cell walls. In the necrotic stage the shadow will be uniform and the cell walls will not be visible.

Apart from the intra-cranial complications which the mastoid, in common with the middle ear, when infection occurs, prognosis of operated cases may be said to be good. Out of 891 cases operated on for acute mastoiditis by Fraser and Halliday, 752 recovered without complications.

Treatment

Non-operative treatment has a place, for the first two or three days after the patient is first seen and that too when mastoiditis is in the early congestive stage. It consists of rest in bed, hot and cold packs. J. H. Lucinian has reported on 50 cases treated with the deep x-ray exposures. A single treatment was sufficient for cure, when the mastoiditis was in the infiltrative stage. Failure to achieve amelioration of symptoms within two or three days means operative treatment, mastoidectomy or mastoid operation.

I shall not describe the steps of the operation in detail I would like to stress on two points. These are the identifications of the suprameatal spine and the aditus. The suprameatal spine should be seen, felt and demonstrated, without which the surgeon is not on safe ground. He is too far behind the area of operation. In two of my cases the lateral sinus has been opened,

as a result of inadequate exposure of the spine. Now I always feel, however long it may take, the time spent over it as well spent. The difficulty arises from œdema of the parts making adequate retraction difficult, from vascularity, and from adhesions of soft parts to bone, when a discharging sinus is present in the antral area. The difficulty of identifying the aditus is met with in sclerotic mastoids. The aditus is sometimes deeply placed, even half an inch from the cortex. The key to success is to work towards the suprameatal spine and the angle formed by its base with the posterior root of the zygoma, and repeated use of the aditus seeker. No mastoid operation is safe unless the suprameatal spine is identified, and no mastoidectomy is complete until the aditus has been exposed.

When to operate—To some surgeons, failure to secure a dry ear within three weeks indicate mastoidectomy. About this interesting time element, in the report of 891 cases of J. S. Fraser and Halliday quoted above, percentage figures, are given of cases operated on within first three weeks. For instances, in the uncomplicated cases 59 per cent were operated on in the first three weeks, while in the complicated cases that recovered 56 per cent were operated on in the same period. I am afraid these figures lead me nowhere towards establishing a time limit. In order to determine when to operate I would rather look for guidance to evidences of toxicity and local inflammation. Thus early occurrence of gross and increasing œdema over the mastoid with obvious constitutional disturbance will be an indication for operation. Where there is protrusion of the ear from subperiosteal abscess, operation is of course indicated. Evidence of lateral sinus infection or meningitis indicate operation. Where paracentesis has relieved the local pain and reduced the constitutional symptoms for a while, but rising temperature with recurrence of pain will indicate mastoidectomy. Finally, persistence of profuse and creamy discharge, or where a previously discharging ear ceases to discharge and there occurs pain and toxemia, the operation is indicated.

Mastoiditis in Infants and Children

There are certain embryological conditions in children which influence the occurrence of infection of the middle ear and through it the mastoid, such as, (*i*) The presence of an opening in the upper (Rivinian) segment of the tympanic membrane which does not always close at birth; (*ii*) mucous membrane is embryonic and more liable to and less resistant to infection; (*iii*) the auditory tube is straighter and more accessible to infection; (*iv*) the antrum is large and superficial and easily infected. The prevalence of various infectious fevers in childhood is an added factor.

The general symptoms of mastoiditis are more marked. Symptoms of cerebral irritation occur frequently. Temperature is more constant. Local symptoms appear early and are more marked. Tenderness over the mostoid and pain is present. Oedema of the whole canal occurs instead of the sagging of the canal wall as in adults, this is owing to the shortness of the canal. Subperiosteal abscess spreads rapidly all round the ear which is displaced outwards. During recent years a syndrome of gastronteritis associated with or caused by a more or less latent infection of the mastoid antrum in infants has been reported by various otologists and pediatricians. It is reported by these observers that following an evacuation of the infected material the symptoms of gastroenteritis disappear with marked increase in weight. Postmortem reports have been published on children who have died of infantile diarrhœa, where pus was present in the antrum although no ear infection was noted before death. The question of operating on these infants is still an open question..

Sulphonamides in Ear Infections

Much information is now available from experiments and experience regarding the methods of administration of these group of drugs. In the light of this experience we have been warned to beware of the dangers like the 'masking' of symptoms, and production of sulphonamide resistant germs and so on, owing to the wrong time and inadequate dosage administered, much correspondence has taken place in the medical press about uses of sulphonamides in ear infection. Huchinson (1941) and Dingley (1944) amongst others after illustrating their experience by case records, have warned against too great a reliance on these drugs, and have drawn certain conclusions regarding the proper use of them. It would appear from these that, it is a mistake which may have tragic consequences, to assume that irrespective of whether myringotomy has been done or has not been done, all is of necessity well with the patient because the temperature has fallen, mastoid tenderness has subsided, and any other symptoms have cleared up. They require careful watching, since complications develop with alarming suddenness. The chief dangers to be met with in cases of otitis treated with sulphonamides are found in those in which this has been the sole treatment. Mastoid tenderness may subside, but the membrane may remain œdematous. In such cases it is difficult to know, what has been happening since the onset of acute symptoms and occurrence of some grave complications two or three weeks later. Such symptoms as pallor, vague headaehes, continued deafness, loss of weight should give rise to suspicion, that a slow, latent and insidious infective process which will not undergo resolution is going on all the time. In suspected intra-cranial complications reliance should not be placed on sulphonamides, they will not check the process and they will mask the symptoms.

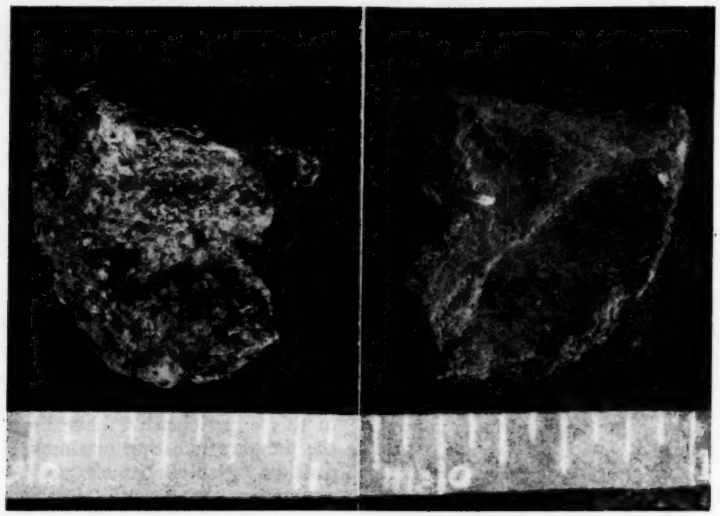
The conclusions to be drawn for guidance are:—

(*i*) Sulphonamides will never take the place of surgical drainage, and should not be expected to do so.

(*ii*) Sulphonamides should be reserved for the period after the incision of the membrane. If fever is maintained, after bacteriological examination, the appropriate sulphonamide may be used in full doses, but not after the end of second week.

(*iii*) After two to four weeks if ear actively suppurating, surgical drainage by a mastoid, not sulphonamides.

(*iv*) Wholesale use of the drugs is to be deprecated.



Photograph of the sequestrum (case 3)

(*v*) If sulphonamides have been given before drainage, examine the membrane frequently, if congested or bulging, incise.

(*vi*) Recurrences are often common, because patients taking sulphonamides often do not acquire resistance of their own.

(*vii*) It is needless to emphasise the uselessness and danger of giving inadequate or erratic dosage of sulphonamides.

Illustrative Cases

Case 1—L.E.S. male, adult, 40, seen on 11-2-44 for discharging right ear for a week, with pain and deafness. He was already taking sulphonamides, M. & B. 693, under medical supervision. Discharge was serous, tympanic membrane inflamed with a central perforation. Seen after a week, the symptoms had subsided, mixed catarrhal vaccines were recommended. After an interval of four months patient seen again on 11-6-44. This time for vague pain all over the head, discharge present off and on. Could not sleep, or attend to work, occasionally felt giddy. M. & B. taken on and off. Operated for mastoid on 20-6-1944, mastoid was sclerotic, antrum could not be differentiated, aditus was fully half an inch deep from the surface. No evidence of involvement of roof. Recovered with dry ear, perforation still present.

Case 2—C.S. adult male 35, seen on 19-8-1944, discharging left ear for four days, already taking M. & B. tablets under doctor's advice. Chief symptom, hammering headache all over, could not sleep, nor attend to work. Tympanic membrane dry, central perforation, but congestion in the posterior quadrant. Seen again on 9-9-1944, for severe headache, feels may became insane. Operated on 9-9-1944, sclerotic mastoid as above, no evidence of infection of roof.

Both cases illustrate masking of symptoms, there being no swelling, mastoid not tender or no fever, chief symptom in both, headache and more headache.

Case 3—B.M. 30 male adult. Seen on 9-10-44, for profusely discharging ear. Some mastoid tenderness. As discharge had been established, duration only a week, put on full dose of M. & B. After a week's treatment, patient's general condition was good, slept well, appetite had returned but discharge had persisted. On examination one morning it was noticed that pressure over the mastoid brought out profuse discharge through the auditory meatus. Feel of the mastoid was that the cortex had been destroyed. Operated on 20-10-44 the whole cavity of the mastoid was filled in by a single sequestrum., of size of betel-nut big enough to fill the cavity completely. The mastoid was cancellous and the sequestrum was friable and crumbling under pressure. Interest lies in the fact that the symptoms were mild, and the drug seemed to be able to limit the process without being able to reach the cavity, hence the sequestrum.

Finally a mastoiditis in a child seen years ago, in which the whole mastoid temporal bone had become a sequestrum. An attempted mastoid operation elsewhere. The wound was being dressed, when one morning the bone under the wound appeared to shift and was levered out with a probe. Exposed the outer surface of the meninges and lateral sinus. Such a sequestrum must be considered as a rare event.

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FACIAL PALSY (?)

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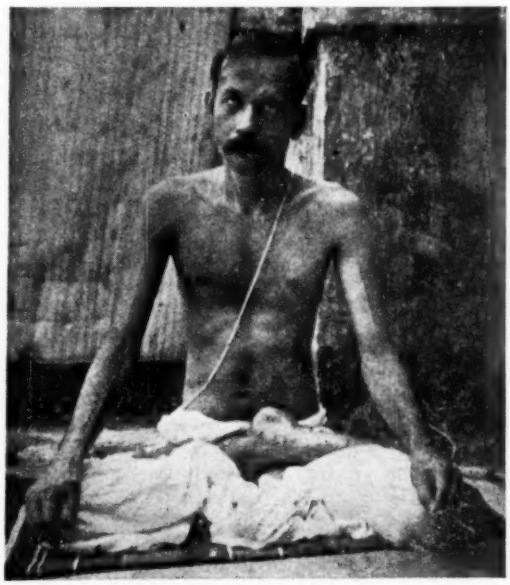
This article attempts to show that by the influence of the psychic area, cells of the motor area of the brain can be induced to suspend their physiological functions, and enjoy perfect rest. It is a point to note that by this method a physiological rest is being achieved, which is the keynote for the efficient maintenance of the functions of the body and the mind. Physiologists are unable to suggest any method by which one can reach this phase of psychophysical perfection. This can, however be reached by psychic culture of yogic method.

Unilateral defects may be in the motor, sensory or in the psychic area in the brain. The conception clarifies our idea about the pathology of neurosis, hysteria, and epilepsy.

There has been, citation of rare cases, of hysteric facial paralysis in the literature, similar to that exhibited in the photo as functional paresis, but in hysteria there is no involvement of the platysma muscle.

A series of photographic impressions were recorded of the author on the same day, in the same sitting, during his practice of yoga. The photo showing facial palsy had been one of them. Of a series of 20 photos,



Protograph of the author showing facial paralysis (left) induced by yoga.

the 9th to the 12th exhibited features of facial palsy. The published photo had been the 11th in the series, and is being published for being more distinct and clearer than the rest. Such phase of yogic depth occurs only in secluded room. The record has been an incidental one, and occurred in that phase of yogic practice. It is doubtful if the pose can be simulated. The palsy being of a functional type protrusion of the tongue should cause a disappearance of the features of paresis.

Description of the Photograph

It clearly exhibits the signs of facial paralysis of the supranuclear type on the left side of the face, and has been much like the pictures seen in the text book on medicine. The lower eyelid has dropped down. The lower a lip on the left side has also dropped down. The facial muscles on the left side appear to be flabby. The left ala-nasi, is less clearly seen than the right. The semi-elliptical furrow in the infra-orbital region, is clearly seen on the left. Furrows and ridges seen on the right side, are absent on the left side. The whole appearance *i.e.,* the marked difference is due to some nervous condition, which is a subject matter of the article.

Notes on the Yogic Phenomenon

As the functional facial paresis had been due to the effect of yoga it will not be out of place if a few lines, explaining the physiology of the practice of yoga be inserted here.

By the systematic practice of yoga, on orthodox lines, the learner gradually develops the power of setting up impulses along the paths in the nervous system. The travelling up of impulses along the brain and the spinal cord appear as passages of mild electric current.

The practice gradually leads to the development of a consciousness of the visceral sensations and acquisition of control over involuntary organs. With the development of the capability of removing the influence of the upper motor neuron from the lower one, contraction of the body takes place. In this phase there is a tendency towards the inhibition of the heart in the stage of systolic contraction.

In still later stage psychic area assumes the power to inhibit the activities of the lower motor neurons as well, when features of flaccidity appear, as has been shown here over a small area (left side face).

In still deeper stage, the heart sound acquires a softness, slowness, indistinctness, and finally tends to cease its contractions. The heart practically stops in the diastolic phase. It is believed however that a feeble circulation goes on with slight movement of the cardiac musculature, the blood being pushed through the heart into the relaxed arteries mainly by the high venous pressure. Respiration takes place by transpiration, as the whole respiratory passages and organs relax. Power of the body to be at rest, capability of the body cells in absorbing and retaining oxygen, as also the power of resisting deoxygenated condition permits of the occurrence of the phenomenon described above. Personality of self, of a yogi, appears itself as the will-force, which rules or governs everything of the body and mind, thus effecting perfection.

OUR IMPRESSIONS OF SULPHATHIAZOLE

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Sulphathiazole compound is a great step forward in therapeutics. Sulphonamide itself is an outstanding discovery, though numerous and varied are its limitations. Sulphapyridine was an advance over sulphonamide especially with regard to pneumococci and to some extent over gonococci. Sulphathiazole is a leap over other sulpha drugs with regard to staphylococci and gonococci. Every sulpha drug acts on every type of pyogenic bacteria, but each one has a specific action on one or more types of bacteria. To illustrate, sulphonamide acts best on streptococci. Similarly, sulphapyridine on pneumococci; sulphathiazole on staphylococci and gonococci and bacillus Pestis. In this paper we are giving our impressions about sulphathiazole* as we have been using it in a variety of conditions. Some of our impressions are supported by laboratory examinations, some by clinical evidence and a few by inferences.

The more recent products sulphadiazine, sulphaguanidine and sulphamerazine have not yet been adequately used by us to give our impressions about them in comparison.

Skin

The drug has been used in the form of ointment and powder externally and internally as tablets. It has no beneficial action on ringworm, scabies, eczema, dermatitis due to animal parasites and psoriasis, either by external application or internal medication or both.

Herpes, secondary infections due to staphylococci and primary staphylococcal infections like furunculosis respond very well. But in secondary infections it is found that reccurrences are common after stopping the drug and other measures have to be resorted to. Very enthusiastic administration to control these secondary infections has in some cases produced a dermatitis characterized by formation of papules all over the body (on microscopic examination revealing only leukocytes) which becomes painful and terribly itching and sometimes more annoying than the primary disease. In all cases where it is desired to control the secondary infections it is wise to use the drug either as ointment or powder which has practically the same effect of cure without these manifestations of dermatitis. Perhaps the drug absorbed is so small that the systemic effect is not produced.

Face, Mouth, Pharynx and Larynx

Facial cellulitis, threatening cavernous sinus thrombosis, gum boils, alveolar abscess, catarrhal stomatitis respond very well.

In stomatitis it is useful to gargle the drug suspended in water and then drink it for the local as well as general effect. In addition to the cure it effects it has an analgesic action and many patients feel free from pain within half an hour after the medicine is taken. We have seen large alveolar abscesses which needed surgical treatment subsiding with sulphathiazole. Acute tonsillitis, follicular tonsillitis and secondary infections in diphtheria are best treated with half pill suspended in cold or warm water gargled and drunk every four or six hours. No type of laryngitis seems to be influenced by sulphathiazole as met with by us.

Alimentary System

Sulphathiazole is of immense value in diarrhœa and dysentery. In infantile diarrhœa it is one of the few drugs which checks it effectively. We use it in doses of one grain every four or six hours until the diarrhœa is under control and then reduce it. In both bacillary and amœbic dysentery we have had good results. In bacillary dysentery it has been used alone and in twenty four hours the number of motions is under control and general condition rapidly improves within three days and a clinical cure is effected. In amœbic dysentery it is a very useful adjuvant to "Entero-Vioform" as it clears the secondary infections and especially so in children. In peritonitis, non-obstructive but possibly infective appendicitis it is useful. In a case of stricture rectum with multiple fistulæ we found half a pill of sulphathiazole used to relieve the local pain.

Genito Urinary System

During the last two years we have met quite a number of cases of fevers which are negative to all the usual tests such as Widal and which on microscopic examination of urine shows plenty of pus cells and various bacilli and cocci. This has appeared in epidemic form which has tempted us to name it "epidemic urinary infection". The exact causitive organism has not been established by us. But all such cases have responded very well to sulphathiazole. In twenty-four to forty-eight hours the temperature comes down and in four to five days there is a clinical cure and after administration of 10 gms. in about a week's time even the urine clears up. Repeated urine examinations thereafter has confirmed a cure. We feel that a large number of such cases have been missed for lack of a routine microscopic examination of urine and has gone on for days and days as pyrexia of unknown origin.

Gonorrhœa once dreaded is no more to be so. More than a hundred cases of acute gonorrhoea have been treated. In all but one it has given a complete cure; even in cases which repeatedly exposed themselves to infections and had recurrence while on the drug. In one case sulphathiazole failed to act and no other drug would act, perhaps Penicillin alone was necessary. We give usually 4 gm. in divided doses on the first day and the discharge stops by then. But the drug is continued until 10 gm. is given and 10 gm. more repeated. Frequent prostate massage,

* The drug used by the authors in their cases was Cibazol supplied by Messrs. Ciba (India) Limited, Bombay.

urine examination and other measures have shown a complete cure. Gonorrhœal arthritis, epididymitis are cured. In our practice we have had no failure in these conditions.

Acute nephritis is another condition in which we have used this drug with much benefit in spite of the said contra-indications. Of course, all these have been bacterial in origin, hence the drug has acted well. A large number of cases treated by us have been secondary to such diseases as scabies with secondary staphylococcal infection and other starting with no known cause. In spite of the kidney damage it has been used by us constantly with great benefit. The puffiness of the face and œdema elsewhere, albumunuria, the casts, the red blood cells gradually disappear and the patient is cured clinically as well as evidenced by laboratory examinations in about three weeks' time.

Respiratory System

Bronchitis, bronchiectasis, pneumonia, pulmonary tuberculosis, empyema, are some of the conditions treated with sulphathiazole. Small doses relieve the cough and distress of bronchitis and influenza in many cases.

In bronchiectasis the action is temporary and lasts only for the duration of treatment. Many types of pneumonias do well even with small doses. The bronchopneumonia, complicating typhoid is not controlled. There are some sulphathiazole resistant types in which other sulpha drugs should be tried. In treating pneumonias it is essential to determine the nature of predominant organism. We had streptococcal pneumonias responding very poorly to sulphathiazole but very well to sulphonamide. The staphylococcal and pneumococcal types if they are not resistant to sulphathiazole are very effectively dealt with even in small doses such as 0·6 gm. thrice daily. It is the growing opinion of one of us (T.K.D.) that it is not necessary to keep up such a high concentration of the drug in the blood as is usually said but that even much smaller doses as 0·5 gm. three times a day is enough to control the disease. But the treatment must be prolonged. In empyema it is advisable to give the drug in small doses prior to operation as it sterilises the pus and the cures are much more rapid than in the pre-sulphathiazole days. The operation is safer, the discharge stops sooner and healing is quicker. Within a month after operation the patient is fit for work. We feel that the drug is contra-indicated in pulmonary tuberculosis at any stage.

Bones and Joints

Gonorrhœal arthritis responds very well. Syphilitic, rheumatic and rheumatoid arthritis are not acted upon. In a case of vague pains over the joints in which a diagnosis cannot be established, it is worth trying sulphathiazole and we have found over seventy-five per cent of such cases getting benefited.

Eyes

In corneal ulcers, Kockweek's conjunctivitis, non-specific iritis and lachrymal abscesses, trachoma, blepharitis, hordeolum, we have administered sulphathiazole by mouth in addition to the old time treatment. The pain is relieved much more quickly and the healing is quicker. In corneal ulcers sulphathiazole has been administered and eyes padded and bandaged without mydriatics. We have found the ulcers to heal up in fortyeight hours and the pain relieved after 1·5 gm. of the drug in one day.

Ear, Nose and Throat Diseases

In suppurative otitis media local dusting of the antiseptic powder stops the discharge. Mastoiditis and Bezold's abscesses are quickly controlled by internal medication. Many cases of sinusitis have got round with repeated doses of sulphathiazole.

Abscesses

The old adage still remains true, "wherever there is pus let it out". But administration of sulpha drugs relieves pain, makes the operation easier and healing is quicker. Many abscesses subside without incision especially round about the anus and rectum. In diabetic carbuncle it must be administered in addition to insulin and necessary surgical treatment.

Acute Infectious Diseases

Eruptive fevers like measles and chicken-pox should not be treated with sulpha drugs, as they not only do not cure the disease but destroy the immunity gained. Some cases have had a recurrence in a fortnight which is much severe and other cases exhibit urticarial reaction.

For plague sulphathiazole is the best available drug. The percentage of success is high in inoculated cases; the relief of symptoms and cure is almost cent per cent in our experience as in other's experiences. In uninoculated cases it is the drug to be used in with any hope.

Dosage

A very effective dose in adults is 1 gm. to start with and 0·5 gm. every four hours for the first twenty-four hours and once in eight hours in next twenty-four hours to complete 10 gm. to 20 gm. as may be needed.

Toxicity

It is the least toxic of the sulpha drugs used by us. The manifestations of toxicity are as follows:

1. Gastro-intestinal—Nausea, vomiting, lack of appetite, hiccough when given in large doses, occasionally diarrhœa and heart burn.
2. Skin—Multiple eruptions, terribly itching treated best by withdrawing the drug and supplementing by vitamin B_1 and nicotinic Acid.
3. Mental disorders observed in only two cases.
4. General—Extreme lassitude and weakness especially when given without proper indications.

CASE NOTE

PROLAPSE UTERUS FOLLOWING NORMAL LABOUR

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Patient aet 30 years, 9th para, was confined outside at 9 p.m. on 9-3-45 and was admitted with the following complaint:

The womb had come down after the birth of the baby and expulsion of placenta. She had a fair amount of bleeding following the accident, fainted, and was subsequently brought to the hospital.

History of labour—The pains had started at 8 a.m. on 9-3-45. Membranes ruptured at 7 p.m. The baby was born at 9 p.m. Placenta was naturally cast after half an hour of the birth of the child. Patient had a small hæmorrhage following the expulsion of the placenta. The placenta was thought to be incompletely expelled, So the patient was asked to sit up and bear down so as to bring out the remaining portion of the placenta. This bearing down caused a sudden descent of the uterus, so that the whole cervix came out of the vulva. The patient developed severe shock and was brought to the hospital.

The weight of the baby was not recorded as it was left at the patient's home. But from the patient's statement it appeared to be of normal size and weight.

Obstetric History—The patient had 9 pregnancies of which three ended prematurely. The 2nd at 5th month, the 5th at 4th month and the 7th at 6th month. The others went upto full term. The previous labours were all normal. Puerperia normal.

Past History—The last pregnancy was uneventful. The patient did not have any decensus uteri before, nor did she feel any symptoms relating to a weakening or laxity of the pelvic floor.

There has been no history of any debilitating disease for the past years.

On examination—Patient's general condition was poor. Pulse 140 per min., regular, of low tension and volume; respiration 26 per min., regular. Blood pressure 90/60 m.m. of Hg.

Local examination—The whole of the cervix was hanging outside the vulva. It was enormously swollen (about 5" in diameter), and œdematous, raw and bleeding. It simulated an inverted uterus, but on further examination the fundus of the uterus was felt abdominally and the external os could be made out through which a sound could be passed inside the uterus. The vulval outlet seemed to be constricting the cervix to some extent but a finger could be passed around the cervix. Perineum revealed a small tear of 1st degree.

Fundus was almost at the level of the umbilicus and was well retracted. There was some bleeding, but it was not from inside the uterus. There was a generalised ooze from the œdematous, swollen and partially constricted cervix.

TREATMENT

The general condition of the patient was very low, hence a pint of normal saline with 12½% Glucose was infused intravenously. The condition of the pulse improved to some extent after the infusion but still the condition did not allow of any active interference. Diffusible stimulants like coramine, camphor in oil were used and repeated every four hours. An astringent antiseptic dressing consisting of 1% acriflavine in glycerine was applied to the cervix.

The condition of the patient improved to some extent the next morning. The pulse rate was 120 min. of moderate volume and tension. Blood pressure was 105|75 m.m. of Hg. She had a rise of temperature upto 102°F. Reposition of the cervix was tried under anæsthesia, but failed because of the bulk of the cervix and friability of the tissues. Local bleeding was less but the pain had increased. Sulfathiazole was given in a dose of 12 gm. in 24 hours to counteract the sepsis and pyrexia. An alkaline mixture was also given Local dressing with glycerine and acriflavine was still being applied.

A blood count showed Hb. 60% (Hellige), total R.B.C. 3·1 million, total W.B.C. 10, 500 c.mm., polymorphonuclear leucocytes 73%, lymphocytes 24%, monocytes 2%, eosinophils 1%.

For the following two days the patient's general condition remained almost the same. But she was unable to pass urine naturally. So a self retaining rubber catheter was put in.

Reposition of the prolapsed cervix was again tried on 12-3-45 as it was smaller in size then, but it failed. The area started to look black and especially on the posterior aspect and a line of demarcation was already appearing around the cervix at the level of constriction. Gangrene could no longer be avoided. A blood count that day showed:—

Hb. 55% (Hellige), total R.B.C. 2·5 million per c.mm., total W.B.C. 9,500 per c.mm., polymorpho nuclears 79%, lymphocytes 17%, monocytes 2% eosinophils 2%. No abnormal cells were found.

The general condition of the patient was apparently improving, but she was running a hectic temperature which varied from 99°F. in the morning to 102°F. in the evening. Urine on culture showed the presence of colon bacillus. The state of anæmia had increased (48% on 14-3-45) for which iron (90 grains of Ferri et ammon citras daily) was administered together with vitamins. The line of demarcation became clearer and more evident on the prolapsed cervix. The temperature persisted inspite of the fact that the urine was alkaline and sulphonamides were used regularly, so the patient was put on an acid mixture and hexamine (40%, 5 c.c., I.V. daily).

The line of demarcation between the gangrenous and healthy portions was well marked on 17-3-45. The condition of the patient was much improved. Her pulse was 116 per minute, of good volume and tension. Blood pressure was 115/85 m.m. Hg. Temperature was 101°F. The blood count showed:— Hb 50%, total R.B.C. 8,730 per c.mm., polymorphonuclears 72%, lymphocytes 24%, monocytes 2%, eosinophils 2%.

It was decided to remove the gangrenous portion of the cervix now, as the condition of the patient had

improved. So she was operated upon on 18-3-45 *i.e.*, 9 days after her admission into the hospital.

The gangrenous portion of the cervix was removed by a diathermy knife at the line of demarcation in the manner of an open guillotine amputation of a limb. No attempt was made to cover the cervical stump, as such covering flaps would not have taken, due to the sepsis present. The two descending cervical arteries were secured with ligatures and the oozing points coagulated with diathermy electrodes. The vagina was lightly packed and the patient was sent back to bed. The patient stood the operation quite well. The pulse rate was rather rapid at first but gradually settled down. She passed urine naturally after 10 hours.

Two days after the operation the patient was given a blood transfusion of 200 c.c. (suitable blood was not available earlier). Her condition was improving. The wound in the vagina was being washed daily with suspension of 20% sulfathiazole in hypertonic saline.

The patient was convalescing steadily for the first few days. On 24-3-45 *i.e.*, 6 days after the operation, she complained of pain in the region of right kidney. The temperature rose upto 101°. Pulse rate was 120 per min. Urine on examination showed the presence of pus cells, R.B.C. and slight albumen. A leucocytic count showed, total W.B.C. 13,500 c.mm., polymorphs 85%, lymphocytes 13% and monocytes and eosinophils 1% each. This was due to an attack of acute pyelitis which was confirmed by further culture of urine. Patient was treated with heavy doses of alkalies, plenty of fluids and sulphapyridine (6 gms. in 24 hours) and application of moist heat on the kidney area. This attack subsided within five days with the above treatment.

A local examination made 12 days after the operation showed that the remaining portion of the cervix had reached and shrunken and was flush with the vaginal vault. Some of the catgut ligatures for the descending cervical arteries had separated and the area was raw. This was cleaned daily with an antiseptic douche followed by application of a 5% solution of mercurochrome. The condition improved very much with it. But again after a week the patient was having a discharge of pus per vaginum and was having a rise of temperature from 99°F—102°F. The uterus was bulky and tender. The condition was a pyometra which was favoured by the progressive shrinking of the cervical stump left, with attended atresic changes. The cervix was dilated daily to relieve the accumulated pus from the uterus. The head end of the patient was raised. Non-specific protein therapy (Milk 10 c.c. on alternate days) was carried on for a few days. The temperature and discharge of pus subsided and patient improved within a week.

The patient was discharged from the hospital on 18-3-45. An examination that day showed the absence of discharge of pus—a slight cystocele was present along with some laxity of the posterior vaginal wall. The cervix was flush with the vaginal vault. Uterus well involuted and parametria were clear.

She was examined again after ten days when the pelvic condition was found to be the same as before.

Discussion

Prolapse of the uterus either partial or complete is a common sequel of labour. But an immediate prolapse following a normal confinement is rather uncommon. In this particular case the patient never had any descent of the uterus before her last confinement. It is well known that prolapse is caused by a damage of the essential ligaments which directly support the uterus. A few words about the mechanism of labour with relation to the occurrence of prolapse will perhaps not be out of place here.

At the level of the internal os some ligaments are attached to the uterus in a circular fashion forming what is known as the 'fixation circle'. These are, pubocervicalis in front, Mackendrot ligaments laterally, and uterosacral ligments behind. This 'fixation circle' is relatively fixed, but it can come down when the ligaments are loose. As the cervix gradually dilates, the ligaments relax gradually and hence when at a later stage, when the the head directly impinges on the lower segment, the fixation circle comes down to some extent without causing any injury to the ligaments. After the expulsion of the fœtus, the fixation circle gradually goes up again and the ligaments again become taut.

Now, if during the earlier stages of labour, when the ligaments are taut, the fixation circle is made to come down by bearing down effort on the part of the patient, it will cause great damage to the ligaments which will cause descent of the uterus. The same will happen, if any forcible bearing down is made after the expulsion of the fœtus when the fixation circle is gradually going up.

In the case under review the prolapse was caused by a sudden bearing down effort of the patient after the birth of the baby. This caused an irreparable damage to the ligaments which immediately caused descent.

The prolapsed cervix was caught between the sphincter, vaginæ, which caused the enormous swelling and congestion of the cervix. Reposition was tried twice but failed. Eventually when a gangrene was threatening, the prolapsed portion of the cervix had to be sacrificed.

The question arises about the future pregnancies of the patient. Though pregnancy is unlikely with such an atresic condition of the cervix, yet the possibility cannot be altogether excluded. If it does occur, then apart from the chances of abortion or miscarriage, a vaginal delivery at term may prove to be very difficult with such a condition of the cervix. The patient is a multipara, with six living children. So the ideal thing would have been a ligation of the tubes. But though the patient was willing, it could not be done as the patient was not a fit subject for an abdominal operation then. If a pregnancy occurs she will need a cæsareian section when the tubes may be ligated.

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LEGISLATURE AND THE MEDICAL PROFESSION

India is a subcontinent of 655,000 villages. Over 90 per cent of its 400 million inhabitants live in and around the villages. While modern towns and highways have sprung up here and there, the villages are still in their old state, where approaches are difficult, environs are filthy, houses are badly planned, water-supply is primitive and inhabitants are the prey of small-pox, malaria, cholera, plague, leprosy, skin diseases and other affections. Visitors to our country and even our own countrymen have described the situation in gruesome tales. Some have blamed the villagers, and others the Government. But the fact remains that poverty and illiteracy are the main causes of this backwardness for which the villagers themselves are hardly responsible. The public health measures which had been introduced from time to time by the Government were scrappy, unimaginative and invariably were sacrificed in the end at the altar of finance.

To serve these 400 million there are about 40,000 doctors or 1 to approximately 10,000 people. Inspite of this low figure we find unemployment and crowding of the profession in the urban areas. We discussed this problem some time back. It is estimated that about 300,000 doctors are necessary for proper medical services to the people. From a recent summary of the Bhore Committee's Report published in the press we gather that it has recommended to provide one doctor for 2000 people. It also envisages to establish treatment centres in the villages with the help of local committees whose co-operation is considered to be essential for the success of the scheme. We hope to discuss this scheme in detail in future. Scientific medicine has made good progress in our country inspite of its illiteracy and low economic level. The benefit of scientific medicine can be made available on a wider scale to the people, if it is made cheap simultaneous with the intense activity of the public health department. It is a good sign that people have become health conscious and demand living wages, better housing, nourishing food and medical benefits. During 1939-41, the Government expenditure on public health was about 1*d*. (an anna is just over a penny) per capita in Madras, Bengal, and the Punjab and about 2*d*. in Bombay. This lamentable lack of public health in our country is a fact beyond dispute and one has only to look at the mortality figures from communicable diseases to confirm this. In one or two provinces the public health services are worse. The Famine Enquiry Commission came to the conclusion that Bengal Public Health services were not only 'insufficient to meet the normal needs of the population' but also that 'the level of efficiency was below the standard of certain other provinces'. Although public health was a transferred subject for the last quarter of a century we fail to understand why so little could be achieved so far except adopting stop gap and tinkering measures here and there.

It looks to us that time has arrived when the medical profession should ventilate the urgent necessity of public health measures for our country in the legislatures. It is unfortunate that so far the members of the medical profession have betrayed a sort of mental apathy and taken no active interest in seeking election to the legislatures and other local bodies. They have missed the opportunity of guiding the legislature along the right line and thereby focussing public attention on urgent reforms on public health problems. In England, the British Medical Association not only set up candidates for Parliamentary Committees but also finance their election expenses. In the last general election, a fair number of doctors have been elected on labour ticket. Now that the Selection Committees of the various political parties are busy in selecting their candidates to the Provincial Legislature, would it not be wise for them to select some competent medical men from the profession, who have given thought to the medical problems confronting the country?

The duty of giving effect to the recommendation of the Bhore Committee will naturally fall on the provincial legislature. Whichever political party dominates in the provinces, public health should be treated above party politics. It will be the duty of the medical men in legislatures to enlighten the house on the need of such efforts. At present dyarchy rules over the public health administration of the provinces. The Ministers-in-charge of the Public Health portfolio have been non-medical men advised by the departmental heads of the Government, the Surgeon-General and the D.P.H. The District health officers are in the employ of the local bodies and the D.P.H. has no control over them and no power of selection or transfer. Much improvement is needed in the above administrative machinery before any health programme is launched in order to bring any progress in the health of the people.

LATE CAPT. P. GANGULY

In another page, we publish an obituary note of Capt. P. Ganguly. He was associated with us as Assistant Editor from 1939-41, when he endeared himself to everybody for his sincerity, erudition and devotion to work. In his death the profession has lost an eminent member and the public a sympathetic physician. We pray to God that his soul may rest in peace.

CURRENT MEDICAL LITERATURE

Abdominal Manifestations of Rheumatic Fever

Reitman (*Ann. Int. Med.*, **22**:671, 1945) writes that association of abdominal pain and rheumatic fever has largely escaped the attention of the internist and the surgeon. Within the past few years several cases of abdominal pain were studied, the apparent cause of which was a rectus myositis which appeared as a manifestation of rheumatic activity.

The outstanding features were sudden onset of sharp pain in the right lower quadrant without radiation, no nausea or vomiting, obvious muscle spasm with tenderness over McBurney's point, and absence of rebound tenderness. When such symptoms and signs are found in a patient with a previous rheumatic history the possibilities or rheumatic rectus abdominis myositis must be considered. An elevated sedimentation rate and a leukocytosis with a normal Schilling index is a further evidence of the rheumatic origin of the symptoms. A therapeutic test with salicylates will cause subsidence within 12 to 24 hours even though other manifestations of rheumatic fever persist.

Chest Pain of Stomach Origin

Harrison (*Am. J. Med. Sc.*, **209**:771, 1945) writes that the clinical analysis in 24 patients with pain in the chest due to disorders of the stomach showed that in a number of subjects the pain radiated from the precordial or substernal region to the left shoulder and arm, and resembled in character and in intensity the distress caused by disease of the coronary arteries.

Most of the cases fell into 1 of 2 groups: (1) Functional distention of the stomach due to pylorospasm, ærophagia, ptosis or a combination of these factors, and chracterized by mild pain, relief by belching, a tendency for the pain to be aggravated by lying on the left side, the co-existence of palpitation, pronounced relationship to emotion, the presence of anxiety reactions out of proportion to the intensity of the pain, and the frequent occurrence in young to middle-aged females; (2) disorders dependent on abnormal pouches in the fundic end of the stomach including hernias, diverticula and cascade deformities, and characterized by pain of mild to intense severity, radiating to the left side of the chest, shoulder and arm, spasmodic and intermittent character, aggravation by ingestion of alcoholic beverages, marked relationship of the pain to eating and to the position of the body, and a tendency to simulate closely the pain of angina pectoris or of myocardial infarction.

Skin Diabetes: Hyperglycodermia Without Hyperglycaemia

Urbach (*J.A.M.A.*, **129**:438, 1945) lays stress on physiologic and pathophysiologic significance of the chemistry of the tissues, i.e. to chemical analysis of biopsy skin specimens. He writes that the average sugar level of the human skin is 58 mg. per 100 gm. and a skin sugar level of more than 68 mg. per 100 gm. is regarded as pathologic. The author gives in the folowing lines the summary of his observations:—

The term "skin diabetes" is suggested to serve as a designation for the syndrome of therapy resistant skin disease (generally presenting the clinical picture of furunculosis, sweat gland abscesses, eczema, pruritus), high fasting skin sugar level together with a normal blood sugar curve, and pronounced improvement of the dermatosis, as well as fall in the high skin sugar level on a low carbohydrate diet, sometimes combined with insulin.

The following points of evidence lend support to the view that there is a connection between the clinical syndrome and a disturbance in the carbohydrate metabolism, as in diabetes: (1) the high fasting skin sugar levels, which attain and even exceed 80 mg. per hundred grams; (2) the pathologic and characteristically diabetic course of the skin sugar curve following oral sugar forcing: (3) the return to normal of the fasting skin sugar level, as well as of the skin sugar tolerance curve after a low carbohydrate diet, notably in combination with insulin.

The evidence tending to negate any connection with a true pancreatic diabetes has been given due consideration.

However, quite aside from the question as to whether or not cases presenting independent cutaneous glycohistechia are actually to be regarded as cases of "skin diabetes," it may be safely said, on the basis of clinical experience, that a diabetic diet should unhesitatingly be tried in cases of therapy resistant skin diseases such as furunculosis, eczema or pruritus, even when the blood sugar tolerance test is normal.

The Hereditary Pattern of Brain Waves

The electroencephalographic records of 71 twins and 1 triplet were studied by Lennox and the Gibbses (*J. Heridity*, **36**:233, 1945). The 1 triplet was counted as 3 dizygotic twins. Fifty-five twins were monozygotic. In these the electroencephalographic trancings were considered identical in 85 per cent, not identical in 4 per cent and in doubt in the remaining 11 per cent. For the 19 dizygotic twins, lack of similarity in the electroencephalographic tracings was found in 95 per cent; they were alike in only 5 per cent. The Boston investigators further found that there was agreement between the physical and brain wave tests of identity in 88 per cent of the 74 twins (including the triplets), disagreement in 4 per cent and doubt in 8 per cent. In contrast with many of the established traits useful in judging the identity of twins, the electroencephalogram was found unstable and subject to frequnt environmental changes. For example, the number of waves per second in the electroencephalograms increase with age, whereas irregularities tend to decrease. Another interesting feature of this study was the observation that the proportion of abnormal electroencephalographic records was higher in this group of apparently normal twins than in the general population. These results sugget that in the absence of acquired variations the brain wave pattern is a hereditary trait. If depndable apparatus and experienced interpretation are employed, the electroencephalogram can be considered a useful method of extending human genetic studies and in tracing neuropsychiatric diseases which are associated with cerebral dysrhythmia. The possibilities of forecasting the inheritance of certain neuropsychiatric disturbances are obvious.

Nutritional Macrocytic Anaemia and the Animal Protein of Diet

Taylor and Chhuttani (*Brit. M.J.*, **1**:801, 1945) write that the incidence, type and severity of anæmia in an Indian adult male population of about 18,000 are shown to depend on the meat content of the diet. Nutritional macroycytic anæmia occurred only in vegetarians in a series of 50 cases. A fu'l blood invstigation of 50 consecutive cases of anæmia in Indian

men in an extreme desert climate, where there was a low sickness rate (about 1·5 per 1,000 per day), showed that the admission rate to hospital for anæmia per 1,000 of population among vegtarians was 22 times greater than among meat-eaters. The incidence of severe anæmia was very much greater in vegetarians than in meat-eaters in this series.

The anæmia differed in type and severity in the two groups, being mainly macrocytic in the vegetarians (nutritional or tropical macrocytic anæmia) and hypochromic and either normocytic or slightly microcytic in the meat-eating group. No case of nutritional macrocytic anæmia was seen in a meat-eater.

In all cases except one a complicating factor was found, hookworm and malaria being most frequent.

The difference in the habits of the two groups, which were otherwise alike, was that social customs prevented the vegetarian group from eating the weekly ration of 20 oz. of fresh mutton in the meat-eaters' ration. The absence of this meat appeared to be the cause of macroycytosis and severity and frequency of anæmia in the vegetarian group. The rations contained over 3,000 calories and over 80 g. of vegetable protein. Riboflavin and vitamin A were known to be low.

It will be of interest to compare these results with findings when the stress of severe frequent malarial infection and dysentery is great.

One case showed that a severe macrocytic anæmia may develop within three months if milk, fresh fruit, and vegetables are much reduced in a vegetarian diet. Another case in which severe macrocytic anæmia developed during a prolonged fever (undulant fever) showed the need of liver and iron in the diet in cases of chronic illness.

Hypoglycaemic Fatigue

Alexander and Portis (*Psychosomatic Med.*, **6**;191, 1944, *Brit. M.J.*, **1**:881, 1945) report on the study of hypoglycaemia as the basis of the neurotic symptom of fatigue. They investigated a group of patients who showed a fairly consistent syndrome. Normally active and energetic, they became ill after a change in their lives which involved application to work of a new and distasteful kind. Thereafter they developed attacks of fatigue which made them almost physically incapable of carrying on with the uninteresting occupation. The feeling of fatigue would be at its worst first thing in the morning, would be somewhat relieved by meals and would pass off almost completely after the largest meal of the day in the evening. Glucose-tolerance tests showed in all patients a distinct flattening of the curve. Though the basal blood sugar was not below normal limits, the usual elevation after administration of glucose was not found. The curve would be restored to normal after a hypodermic injection of 1/75 gr. atropine. Good therapeutic results were obtained by psychotherapy, giving a diet containing no free sugar but complex carbohydrates, and an injection of atropine thrice daily. The authors believe that the syndrome consists essentially in a disturbance of homoeostatic regulation of the blood sugar. The feeling of zest with which the healthy man faces his daily activities represents a certain tonus in the vegetative system. A more enhanced tonus of the same kind is produced by feelings of fear and rage. If zest fails, the tonus drops and any sustained activity cannot be so well maintained. The patient tries to drive himself on to activities which cause a paralysing vegetative relaxation. Vagal preponderance results in a state of hyperinsulinism, demonstrated by the glucose-tolerance test. Administration of atropine diminishes the vegal tone and shifts the balance in favour of sympathetic tonus, and so helps to break the vicious circle.

Sulphonamide Rashes

Peterkin (*Brit. M.J.*, **2**:1, 1945) writes that from Feb. 1943 to Dec. 1944, over 650 cases of cutaneous sensitivity of sulphonamides have been seen in North Africa and Italy: of these, 500 are reported and classified into 16 various types.

These reactions were due to the treatment of many different conditions, from major wounds and burns to slight grazes, impetigo, and chancroid.

Only three of the types described are liable to cause a grave or prolonged illness—i.e., the pemphigoid, the sulphonamide-light eruption, and the sulphonamide contact dermatitis.

Sulphonamide-light dermatitis accounted for 72% and contact dermatitis and its compolications for 17·2% *i.e.*, 90% of the total.

Most cases of reaction were due to the use of sulphanilamide in powder form; the safest drugs appeared to be sulphadiazine and sulphaguanidine.,

Acriffavine can reactivate a sulphonamide-light or contact dermatitis just as may cocaine.

No race is exempt from this sensitization—skin, colour and texture make little or no difference.

Sulphonamide reactions are uncommon in U.S. troop compared with British.

The local application of sulphonamides is contraindicated in skin diseases, though there is little risk if the drugs are used with certain precautions.

Intramuscular penicillin appears to be the treatment of choice in two types—the pemphigoid and the severe light dermatitis.

Sulphadiazine Dysuria

Jepson and Whitty (*Lancet*, **1**:751, 1945), during the treatment of some 450 penetrating head wounds with sulphadiazine, had an opportunity to study the dysurias occurring with this drug. After an initial 3 gm. intravenously, 3 gm. was given by mouth four-hourly for forty-eight hours. In the first 40 cases so treated 20 grains (1·3 gm.) of sodium bicarbonate and the same amount of sodium citrate were given with each dose of sulphadiazine. No special attention was paid to fluid intake apart from maintaining an average daily intake of about 8 pints (3,840 cc.). In this series there were 6 cases (15 per cent) of poisoning. This comparatively high incidence caused the authors to review the alkali and fluid intake, and thereafter, in a further series of 410 cases, with each dose of sulphadiazine, 40 grains (2·6 gm) of sodium bicarbonate and 30 grains (2 gm) of sodium citrate were given and a total fluid intake of 10 pints (4,800 cc.) in twenty-four hours was aimed at. In this series 11, or 2·5 per cent of patients developed dysuria; that is, there was a total of 17 cases of dysuria among 450 patients with head wounds. The incidence bears a close relation to urinary pH; no case occurred with a pH of over 6·5. No sulphadiazine deposit was found in any urine examined with a pH of over 7·5. Neither dosage nor length of administration appears to affect the incidence. Intense abdominal pain with loin tenderness, oliguria and blood stained urine are the presenting symptoms.

Prophylaxis depends on the control of urinary pH and output. Treatment is by intensive intravenous fluids with alkalis. In only 5 cases was ureteral catheterization done and it was probably necessary in only 2. None of these cases were fatal.

Synergic Action of Penicillin and Sulphathiazole

Brigger (*Brit. M.J.*, **2**:621, 1945) at a meeting of the Section of Pathology of the Royal Academy of Medicine in Ireland read of paper on the synergic action of pennicillin and sulphathiazole on Bact. typhosum. By using broth from which antagonizing substances had been removed by the method of Harper and Cawson he had found that sulphathiazole in a concentration of 10 mg. per 100 c.cm. had a considerable inhibitory effect upon the growth of small inocula of typhoid bacilli. With large inocula it was almost without effect. Penicillin in a concentration of 9 units per c.cm. and less had some inhibitory effect, even on large inocula.,The combination of sulphathiazole and penicillin was not only inhibitory but bactericidal; 4 units per c.cm. of penicillin and 10 mg. per 100 c.cm. of sulpathiazole sterilized broth containing 70,000 typhoid bacilli per c.cm.; penicillin, 1 unit per c.cm., and sulphathiazole, 10 mg. per 100 c.cm., sterilized broth containing 7,000 typhoid bacilli per c.cm. He outlined a scheme for trial in clinical cases.

Simple Test for Penicillin Sensitivity

Routine testing of the sensitivity of pathogenic organisms to penicillin provides the clinician with essential information and saves the drug from being wasted on unsuitable cases. When supplies become plentiful the temptation to dispense with laboratory control will increase, and the existence of a simple, reliable, and rapid test for sensitivity will then help to ensure that penicillin therapy continues to be properly directed. A new modification of an old methods (*Morley—J. Path. Bact.*, **57**:379, 1945) avoids the need for continually making up fresh solutions of penicillin and is simpler to perform than most of the tests now employed. Sterile disks of blotting paper, 12 mm, in diameter, cut with a cork-borer, are impregnated with penicillin solution so that each disk contains one unit. The disks are then dried by keeping them at —20°C or in the refrigerating chamber of an ordinary refrigerator for 48 hours. The dry disks can then be placed with sterile forceps in a desiccator and kept in the cold. Anhydrous calcium sulphate as recommended by Flosdorf and Mudd (*J. Immunol*, **34**:469, 1945) is an excellent desiccant, and all that is needed is to coat the inside of a small glass pot with plaster-of-paris cream to which a small amount of cobalt chloride is added as a moisture indicator. The plaster-coated pots are heated in a hot air oven at 180°C for an hour, and when cool are ready to receive the penicillin disks. It is wise to seal the lids of the pots with 'Plasticine,' and under these conditions the disks remain dry and potent for many months. In the actual test a disk is removed from the desiceator with sterile precautions and placed on the surface of an agar plate so that the inhibiting effect can be seen both in an area where colonies are crowded and where they are sparse. After incubation, sensitive bacteria are usually absent from an area about 1 cm. wide around the disk. Among the advantages of the method are the stability of the dried penicillin in the disks and their suitability for use in primary plates, so that culture and sensitivity readings can be given at the same time. Morley has also used this technique with sulphonamide preparations instead of penicillin incorporated io the disks. For this purpose solutions are made in broth, which is a better solvent than saline, and the disks are used on lysed blood-agar plates.—*Lancet*, **2**: 679, 1945.

The Treatment of Bacterial Endocarditis

In a series of papers S. R. Kelson, P. D. White, and other collaborators (Ann. Int. Med. **22**:40, 61 & 275, 1945) analyse a large number of cases of subacute bacterial endocarditis seen at Boston and elsewhere in the U.S.A., and by grouping them into three therapeutic periods they give a clear picture of what has recently been achieved in the treatment of this disease. These papers provide the most important contribution to the literature of their subject for some years, and contain much information of interest from other points oi view than the therapeutic. The first group consists of 250 cases seen in Boston between 1927 and March, 1939; only 33 of these were treated with sulphonamides; the other treatments employed were of forty-three different kinds. Only one patient made even a temporary recovery to die of rheunatic carditis a year later; he had received no specific treatment. A second group between 1939 and 1944, all treated with sulphonomides, consists of 77 patients, of whom 6 recovered; 3 of these and 14 of those who died also received heparin. A combination of heparin and sulphapyridine, according to Kelson, affords the best prospects of success, and in a separate paper, dealing with another group of 34 patients, he records 8 apparent recoveries following this treatment, together with two others in which sulphadiazine, and both sulphadiazine and penicillin, were combined with heparin. A third small group in the main series comprises 9 patients treated with penicillin, 4 of whom have apparently recovered, while in 2 others the infection was suppressed, although they are now ill or dead from other causes.

A more complete picture of what penicillin will do in this disease is afforded by the observations of Loewe, (*Bull. N.Y. Acad. Med.*, **21**:59, 1945) who has now treated 54 coses, with 14 failures and 40 successes, 37 of the latter being alive from 2 to 15 months later and 3 dead from other causes. It is an important feature of this author's method that every patient is also given heparin, not intravenously but subcutaneously in a gelatin menstruum from which slow absorption takes place; the necessary dose, usually about 300 mg. every second or third day, is determined for each case by estimations of the coagulation time, which is kept at between 30 and 60 minutes. He strongly advocates that penicillin should be given by continuous intravenous infusion in order to maintain a constantly adequate level in the blood. What that level must be depends on the sensitivity of the streptococcus in each case, and he recommends that the aim should be to maintain a concentration 5 to 10 times greater than the minimum required to inhibit the growth of the organism. M. G. Dawson and others (*Proc. Soc. expr. Biol. Med.*, **56**:101, 1945) have previously reported very wide variations in the susceptibility to pennicillin of different strains of streptococci from cases of endocarditis, and anyone who has studied these organisms knows that their characters are almost infinitely variable. The concentration of penicillin required to inhibit the growth of strain from Loewe's case varied from 0·007 to 0·5 unit per c.cm; 3 strains exhibiting high resistance are said to constitute a distinct and hitherto undescribed variety, and treatment failed in the cases from which they were derived. The regulation of dosage of this principle resulted in variations in the daily dose between 40,000 and 1,000,000

units, and in the total amount given between 867,000 and the enormous figure of 48,930,000 units. An inadequate dose may cause the streptococcus to develop resistance; a forty-fold increase in its resistance was observed in one case. The duration of treatment should depend on that of the disease, but if possible a five-weeks course should be the minimum. Loewe considers that in cases of less than three months' duration, due to a reasonably sensitive organism and in patients in good physical condition, a good result may be expected in almost every case. It does not follow, of course, that such patients will be restored to normal health. Gross valvular incompetence must remain, and of those patients who have undoubtedly been cured of their infection during the past few years, a number have succumbed later to progressive cardiac failure.

Another American report on this subject is by M. H. Dawson and T. H. Hunter (*J.A.M.A.*, **127**:129, 1945) who have treated 27 cases in three groups. The first 5 were carefully selected favourable cases treated with penicillin only; since 2 of these relapsed but later recovered completely after a course of penicillin combined with heparin, administered in 1 case by Loewe himself, the next 15 were all given heparin by Loewe's method in addition to penicillin. Of these 15 patients, 11 recovered, 2 died, and 2 are still suffering from the disease. A final series of 7 cases has recently been treated, of which 5 had no heparin, with so far apparently equally good results; whether heparin is helpful is, therefore, a question still *sub judice*. Dawson and Hunter agree with Loewe that the dose of penicillin should be determined by the degree of sensitivity of the streptococcus—cases with hopelessly resistant organisms being rejected—and that a prolonged continuous course is necessary.

The treatment of subacute bacterial endocarditis with penicillin in this country is at present confined to specified instituions,. That this study should be kept on a research basis is obviously desirable untill the best methods have been clearly defined. If those advocated by Loewe are finally accepted, this will always be a major therapeutic undertaking and restricted of necessity to hospitals where fullest laboratory and other facilities are available. It will be interesting to see whether the ultimate verdict is pronounced in favour of combining the use of heparin with penicillin treatment. Heparin in endocarditis has never found much favour in this country, owing to its undoubted danger, but to judge by Loewe's present results the method of administration he now employs must have overcome this to a large extent.—*Brit M.J.*, **1**:812, 1945.

Prostigmine Therapy of Neuromuscuear Dysfunction

Kabat (*Pub. Health Reports,* **59**:1635, 1944, Ref. *South African M.J.*, **19**:430, 1945) writes that the purpose of this investigation was to study in a preliminary way the efficacy of prostigmine therapy in a variety of types of chronic neuromuscular dysfunction. Observation of 53 patients under this treatment has revealed that improvement in range of motion, relief from pain, and increase in strength and increase in strength and endurance may occur rapidly in cases of disability following trauma, of hemiplegia and related neurological conditions, and of chronic rheumatoid arthritis and subacromial bursitis. Most of these patients suffered from severe neuromuscular dysfunction for a long period of time, did not have spontaneous remissions, and had failed to improve with other types of therapy. Disability resulting primarily from muscle spasm or hypertonus, muscular pain, and cetain types of paresis frequently appears to respond to prostigmine therapy. Many patients with chronic disorders have other conditions, such as bony or fibrous ankylosis, active inflammation, and loss of innervation, as primary causes of their disability and these cannot be expected to benefit prostigmine therapy. Prostigmine therapy, it was concluded, may be followed by increased range of passive motion, increased voluntary power, and relief from pain in selected chronic cases of disability following trauma, hemiplegia and related conditions, and rheumatoid arthritis and subacromial bursitis.

Penicillin Cream in Sycosis Barbae

Burrows and others *Brit. J. Dermat. and Syph.*, **57**:97, 1945) report on the observations on 21 patients in whom they used penicillin cream. When bacteriologic examination had disclosed that the prdominant organism was penicillin sensitive the patient was provided with a pot of penicillin cream containing 200 units of penicillin per gram. The sterile cream base can be kept in screw capped jars indefinitely and when penicillin is needed a jar can be warmed to 60·C and the penicillin solution added to obtain the concentration required. Little stirring is necessary as the penicillin diffuses readily in the cream base. The patient was instructed in the technic of the aseptic removal of the cream from the jar. A knife or a spoon can be sterilized by boiling in water for three minutes and cooled under a running tap; the cream is removed from the jar and spread on clean lint and thence applied thinly to the affected area twice a day. Of the 21 cases of sycosis barbae investigated bacteriologically 19 were caused by a penicillin sensitive strain of staphylococcus. Of 13 cases with a history of more than one year 6 were cleared in an average time of six weeks and 6 were improved over an average period during the same period. Of 6 cases with a history of less than one year 4 were cleared in an average time of two and one-half weeks and 1 was improving over a period of five weeks. No improvement resulted from the treatment of 2 cases due to insensitive strains of bacteria. In order to lessen the tendency to relapses the authors recommend (1) application of the penicillin cream to the anterior nares as well as to the skin of the beard area, (2) treatment of nasal discharges, blepharitis, or otitis media or externa if present, (3) treatment of any other manifestations of the seborrhœic state, (4) elimination of foci of sepsis in the throat, teeth and sinuses, (5) continuation of treatment for a few weeks after apparent cure, (6) use of the cream prophylactically after relapses or if nasal swabs remain persistently positive, (7) instruction of the patient to discard his infected shaving brush and face flannel or sterilize them by boiling or to use a brushless shaving cream and (8) consideration in severe cases of the use of x-ray epilation in conjunction with penicillin.

Diagnosis of Bone Tumors by Aspiration Biopsy

Synder and Coley (*Surg. Gynec. & Obstet.*, **80**:517, 1945): survey 567 bone aspirations done on 474 patient during the last twelve years. There have been no immediate complications of the procedure and no evidence to suggest more rapid development of metastasis. In primary bone tumors and metastatic carcinoma, bone aspiration has been done in 385 cases, of which 67·5 per cent were definitely and specifically diagnostic, while a total of 82 per cent showed

material sufficient for the diagnosis of tumour, the exact type of diagnosis not being called in 14·5 per cent. In only I instance was a diagnosis of malignant tumor made when the resected specimen showed a benign tumor and in this case the treatment was local resection. Thus in no case did a false aspiration diagnosis lead to amputation for a benign process. The clinician must understand the scope and limitation of the method and realize that failure to obtain calls means only that no tissue was obtained, further interpretation depending on the clinical and roentgenographic findings. Aspiration biopsy biopsy has proved itself to be a valuable and reliable diagnostic procedure.

Survival After Roentgen Therapy for Mammary Carcinoma

Gratzek and Stenstrom (*Radiology*, **44**:44, 1945) analyzed the records of 731 patients who received irradiation therapy for carcinoma of the breast at the University of Minnesota Hospitals during the 13 years 1926-1938 using the date of the first deep rœntgen ray treatment as the beginning of the survivial period. Up to 1939 they succeeded in a follow-up study of all but 17 of the 731 treated. All but three of the patients were women. Eighty-five per cent were over the age of 40; 457 patients (66 per cent) had had symptoms lasting one year or less; 324 (44 per cent.) had received post-operative prophylactic therapy with a three-year survival of 210 (65 per cent.), a five year survival of 129 patients out of 254 treated (51 per cent.) and a ten-year survival of 37 out of 128 treated (29 per cent.). Four hundred and seven (56 per cent.) were treated for recurrent, metastatic, and inoperable lesions, with a one-year survival of 223 (55 per cent.); 76 patients surviving three years (18 per cent.) 29 patients out of 333 treated surviving five years (9 per cent.) and 7 out of 178 (4 per 2 carcinoma of the breast.

Metastases were most common in axillary nodes, bones, the supraclavicular region, and lungs. Early diagnosis and immediate irradiation therapy following radical mastectomy gave the best results. Lung fibrosis as a complication can be minimized if a suitable technique is selected and fields are properly rotated. The authors concluded that early diagnosis with immediate radical surgery followed by adequate deep rœntgen ray therapy or operation preceded by irradiation produces the most favourable results known to-day. The statistics from various clinics, they say, show a much higher percentage of five, and ten-year survivals with this combination than with surgery alone in the presence of so-called Stage 2 carcinoma of the breast.

Trichlorethylene in Dental Surgery

Galley (*Lancet*, **2**:597, 1945) gives in the following lines the summary of his observations:

Three methods have been discribed using trichlorethylene as an anæsthetic for minor and major dental surgery.

The single-dose method is ample for short anæsthesias, and the apparatus is portable. Anoxaemia is avoided, with consequent diminution of venous congestion and oozing, thus facilitating the task of the extractor. Induction is lengthy, however, when compared with that of nitrous oxide and trochlorethylene or nitrous oxide alone. If the duration of the induction is overestimated, children are apt to hamper the running of a clinic by taking longer than necessary in waking up. This last effect resembles that of ethyl chloride, but there is little or no sickness.

Nasal nitrous oxide with minimal addition of trichlorethylene combines the rapidity of induction of nitrous oxide, used alone, with an additional ease of maintenance and an almost equal rapidity of recovery. Further, larger percentages of oxygen can be used than is usual with gas-oxygen anæsthesia, which makes the method particularly applicable to patients with anaemia, cardiac insufficiency, or chronic pulmonary disease other than tuberculosis. The occasional cardiac arrhythmia in the presence of such small quantities of trichlorethylene does not appear to preclude its use in the mild cardiac cases; in fact, twenty-one such (all mitral stenosis or insufficiency with slight dyspnœa on exertion) have been anæsthetised without complication.

Endotracheal administration of nitrous oxide, oxygen, and trichlorethylene has proved a useful method of anæsthesia for major dental surgery; a little ether may be necessary to settle the robust type of patient; but it can usually be dispensed with after that. Recovery is very rapid when compared with nitrous oxide and ether, and vomiting is almost unknown. Selectd patients have even been allowed to return home on the day of operation. It is better, however, to premedicate with omnopon, 'Nembutal,' when the patient can stay the night in hospital; in this event anaesthesia is much smoother, and the anaesthetist rarely has to resort to using ether.

Incidence and Causes of Blindness in British Commonwealth

Sorsby (*Brit. M. J.*, **2**:557) gives a detailed report on the incidence and causes of blindness in the British Isles, dominions and other possessions. *Incidence of blindness in India*—In India the census for 1931 showed 606,360 blind in a population of 352,837,778—a rate of 172 per 100,000. It is generally agreed that this is a considerable underestimate. If the rate of blindness known for England and Wales applied to India, its population of over 400,000,000 would provide 800,000 to 1,000,000 blind. But blindness in India is far more common than in England and Wales, and it appears that Indian census figures on blindness are grossly vitiated by the widespread illiteracy and by superstitious fears. On studies undertaken in selected areas both Henderson and Kirwan hold that the census figures indicate only one-third of the blind in India; Megaw puts it as low as one-quarter. Moreover, even these observers, in speaking of blindness, use a considerably lower criterion than that now used in England—i.e. counting fingers at one metre instead of 3/60. At the very least the census figure of 606,360 must therefore be multiplied by three or four. This gives the number of those totally or subtotally blind as between 2 and 2½ millions. For the present this must be accepted as a minimum figure. The actual number is likely to be considerably more.

Causes of Blinding in India—Several analyses of the causes of blindness in relatively small series are available. In a series of 2,750 reported by Megaw cataract was responsible for 23%, glaucoma and small-pox for 9·0% each and trachoma for 8·0%. In a series of 2,044 blind eyes Ganadikam found that among those blind in both eyes the order of frequency of the causes was glaucoma, corneal ulcer, keratomalacia, trachoma, iritis, small-pox, and gonorrhoeal ophthalmia. Another observer (Bagchi) gives the following order of frequency in 3,404 persons blind in one or both eyes;

anterior staphyloma, 39·7%: trauma, 7·0%: trachoma, 6·2%: leucoma, 5·9%: keratomalacia, 5·5%. In 74 inmates of the Calcutta Blind School India found the following distribution; congenital, 15 cases; small-pox, 11, syphilis, 10; ophthalmia neonatorum, 5; keratomalacia, 4—the last being regarded as an underestimate of the frequency of the affection, "as few such children can afford the expenses of the Blind School". Wright (1937) gives the principal causes in order of importance as:

In Children.	*In Adults.*
Keratomalacia	Cataract
Ophthalmia neonatorum	Optic atrophy (Mainly syphilitic)
Congenital syphilis	Corneal ulcers
Hereditary blinding disease	Trachoma

while in both children and adults irritant remedies (the result of ignorance and the lack of adequate facilities for treatment) and small-pox are potent factors. All these assessments have one thing in common; the immense amount of blindness caused by various uncontrolled infective processes and by malnutrition.

Prevention of blindness in India—Such Indian blind statistics as are available give prominence to lesions like anterior staphyloma (39·7% in one series), leucoma, and corneal ulcer. Trachoma is known to be endemic in some parts of the country; small-pox is still a significant cause of blindness, while ophthalmia neonatorum and congenital syphilis are recognized as important causes of blindness in children. All this is reminiscent of England at the beginning of the last century. The control of blindness in India is thus largely a problem of the control of infectious disease. That this is not purely an issue of pathology and pharmacology is obvious enough from the history of public health in Western Europe, and is grimly emphasized by the fact that keratomalacia—a nutritional deficiency disturbance—is ranked as first among the causes of blindness in children. The problem of blindness in India is not one of the elimination of a particular infectious disease such as trachoma or the acute ophthalmias. It has to be conceived in terms of standards of living, education, facilities for treatment, and adequate and well-trained ophthalmic personnel. None the less there is much that can be done immediately both outside and as part of the long-term plans-how much, can be seen more clearly from a consideration of the position in Egypt and Palestine, Here the social problems are not dissimilar in their braod aspects from those seen in India., but unlike in India two clearly defined infectious diseases are the main causes of blindness, the acute purulent ophthalmias and trachoma. Purulent ophthalmia, the more significant cause, is now easily treated by the sulphonamides and penicillin. An immediate and striking reduction of blindness in Egypt, Palestine (and, indeed, throughout the whole of the Near and Middle East), and perhaps India, could be brought about by the organization of relatively simple treatment stations and possibly mobile units, with adequate supplies of the new chemotherapeutic and antibiotic agents. Trachoma, too, could be considerably reduced by such stations, for the beneficial effect of sulphonamide therapy in trachoma is no longer open to doubt; moreover, there are indications that penicillin may also be highly effective. The creation of such treatment stations will in any case have to be undertaken in any long-term programme, but a sense of urgency has now been supplied by the availability of the new therapeutic agents, for each day that such treatment is not available to the millions of Africa and Asia adds many blind to the rolls of the avoidably blinded.—*Brit. M. J.*, **2**:560, 1945.

Veratrum Viride in Hypertensive Syndromes of Pregnancy

Harkins (*Texas State J. Med.*, **41**:143, 1945) reviews observations on 34 cases of severe preeclampsia and 14 cases of eclampsia. Evidence is a presented that vasospasm of the terminal arterioles plays an important role in the pathogenesis of the disease. Emphasis is placed on veratrum viride as a vasodilator. Only one preeclamptic patient developed eclampsia under the described treatment. Rapid control of convulsions was accomplished by a combined therapeutic regimen which included hypertonic glucose by vein, magnesium sulphate intramuscularly and veratrum viride hypodermically. Cæsarean section was not deemed necessary in any of the preeclamptic or eclamptic patients. There were no stillborn infants among the preeclamptic patients and only 1 among the eclamptic. The use of veratrum viride in some of the other hypertensive syndromes of pregnancy is believed to be of value and is under further investigation. A series of 11 such cases is presented. Veratrum viride, in the form of a purified aqueous solution of the active alkaloid, can be given in therapeutic doses without signs of drug intoxication, without producing vascular collapse and without the need of antidotes.

Sore Nipples: Causes and Prevention

Gunther (*Lancet*, **2**:591, 1945) writes that the common types of sore nipple have been distinguished; the erosive or petechial and the ulcerative or fissure.

The position of the petechial lesion and the strong sustained suction found to be exerted by the baby are taken to indicate that suction unrelieved by swallowing is the main cause of the petechial type. Venous congestion and lower capillary resistance may contribute to their causation.

To prevent the ptechial type the child should not be left on the breast for more than 2 min., when it is obtaining nothing. The child should takes as much of the areola as possible into its mouth.

Ascorbic-acid supplement was without effect on soreness and capillary resistance.

It is suggested that fissure of the nipple is due to the reduction of œstrogen level after delivery.

Vitamin E in Menopause

Christy (*Am. J. Obstet. & Gynæc.*, **50**:84, 1945) gave vitamin E in the form of a synthetic preparation, ephynal acetate, in 10 mg. tablets, to 25 patients ranging from 22 to 55 years. Of this group 12 had carcinoma of the cervix, 1 had adenocarcinoma of the fundus, 1 had malignant leiomyoma and sarcoma of the uterus, 6 had fibroids, 1 had carcinoma of the ovary, 1 had hemangioendothelioma of the parametrium, 1 had postmenopausal bleeding after œstrogenic therapy, 1 had dysfunctional uterine bleeding due to endocrine disorder and 1 had endometriosis. No patient was treated who did not complain of severe symptoms of vasomotor instability. The amount of the drug taken varied from 10 to 30 mg. a day, depending on the degree of severity of symptoms, over periods of from one to six weeks. Seven patients reported complete

and 16 great relief. The relief of symptoms in patients after administration of vitamin E could not be distinguished from that obtained with the natural or synthetic œstrogens. In some cases vitamin E seems more effective in relieving the symptoms of vasomotor instability than œstrogens. The chief advantage over œstrogen is that vitamin E is free of any stimulative effect on the genital system or on the parenchyma of the breast. It plays no carcinogenic role as the œstrogens may do and therefore can be used freely in menopausal patients with neoplastic disease. It is well tolerated.

Normal Physiologic Douches

Karnakey (*Am. J. Surg.*, **69**:107, 1945, Ref. *J.A.M.A.*, **129**:408, 1945) points out that many physicians are still prescribing alkaline substances, sodium perborate, borax, sodium bicarbonate, potassium permanganate, magnesium sulphate and sodium chloride or a combination of these, in the treatment of vaginal leukorrhœa or as a cleansing douche when it is scientifically established that the normal hydrogen ion concentration of the adult vagina is acid. He thinks that acid douches (pH 3·0 to 5·0) should be used, because with pathologic changes there is hypoacidity of the vagina, and, as these changes increase, the hydrogen ion concentration approches the alkaline side. Alkaline douches favour the growth of pathogenic organisms. The best douche found in ten years of research is vinegar. The patient should be instructed to use 5 tablespoons of vinegar to the douche bag if there is an acute vaginitis. After two weeks, 2 to 3 tablespoons is used instead of 5. For an ordinary cleansing douche 3 tablespoons of vinegar should be added to the douche bag.

Heart Block in Diphtheria

Cookson (*Brit. Heart J.*, **7**:72, 1945) investigated 83 cases of diphtheria and took cardiograms at intervals throughout the illness. In 63 patients, or more than three fourths, the cardiogram was abnormal. Ten of these showed some defect of conduction; the others, inversion of T in one or more leads. Other abnormalities commonly seen wre axis shift, slurring and slight widening of QRS, and bizarre P waves. Clinical and cardiographic findings are given of 8 cases showing conduction changes. Of 4 with latent block, a prolonged PR interval has persisted in 1 for five months. Bundle branch block appeared in 4 unimmunized children aged 12 or less, and all died. complete block was recorded in 1 of the 4. In 2 others bizarre ventricular complexes were found in association with a passive ectopic rhythm; at first sight these suggest a bundle branch lesion; but, like the short PR, wide QRS syndrome, which seems a related condition, these changes do not appear to have prognostic significance.

Aniline Poisoning From Marking-Ink

Nearly 60 years ago a curious outbreak of cyanosis among babies in London was traced to absorption of aniline from the marking-ink used to mark their napkins. The danger of using such napkins before they have been boiled or otherwise laundered seems to have been forgotten, because Graubarth and his colleagues (*J.A.M.A.*, **128**:1155, 1945) of New Orleans now report 17 cases of poisoning from this cause with 4 deaths, and they have collected nearly 40 reported instances of similar trouble. Of 32 babies in the nursery at Touro Infirmary, 17 unexpectedly and gradually became cyanotic, with rapid and in some cases difficult breathing. All of those affected were wearing unwashed napkins stamped with an aniline dye, whereas the remaining 15 were wearing old napkins. Wartime shortage, both of napkins and of staff, is balmed for the mishap, although it might, out of ignorance, happen anywhere. Other clinical manifestations included irritability, jaundice, loose stools, vomiting, hæmaturia, and in one instance an enlarged spleen. Of those who survived none showed any evidence of cerebral damage and there was no report of any refractory anæmia. Of the 4 deaths, 3 were in premature babies. Differential diagnosis is concerned with other possible causes of cyanosis—congenital heart disease, enlarged thymus gland, pneumonia (especially that associated with the aspiration of foreign material), intracranial hæmorrhage, inhalation of coal-gas, various drugs, and disinfectants; all these were eliminated, and Graubarth made the diagnosis on the basis of a similar experience in Cincinnati in 1929. Treatment included the adminstration of methylene blue, gr. ½ with each feed for 2 days, and the use of oxygen with 5% of carbon dioxide. Blood-transfusions were given to 9 infants. Neither oxygen nor methylene blue had any obvious effect. Apart from the removal of the source of poinsoning, transfusion of blood or red cells suspended in saline seems the most logical treatment. The conclusion to be drawn from this accident is that all newly marked clothes must be laundered before being worn by babies, or indeed by anybody—*Lancet*, **2**:503, 1945.

Penicillin Therapy of Rat Bite Fevers

Wheeler (*Am. J. Dis. Child*, **69**:215, 1945) writes that twenty-five cases of rat bite were treated at the Children's Hospital of Michigan during 1944. One child died of pneumonia after extensive rat bites but without clinical signs characteristic of rat bite fever. Five others had rat bite fever. Spirillum moniliformis was isolated from the blood stream of 4 of these children and Spirillum minus from that of 1 child. One of the children with infection due to S. moniliformis died of diarrhœa and jaundice after having had one dose of oxophenarsine hydrochloride. The remaining patients were treated with penicilin and had prompt and dramatic recovery. A dose of 5,000 units of penicilin given intramuscularly every two to three hours for a week to ten days seemed adequate to control both types of infection in these babies, who weighed from 5 to 12 pounds (2·3 to 5·4) Kg.). The author has found that it has been possible to isolate and cultivate Streptobacillus moniliformis easily, using only the mediums and equipment which are routinely employed in the laboratories of most children's hospitals.

Treatment of Gastro-enteritis with Sulphadiazine

Woodrow and Douglas-Henry (*South African M. J.*, **19**:387, 1945) of the child welfare centres of the Cape Town City Health Department report that (1) one hundred and two unselected cases of infective gastroenteritis in children from 1 month to 4 years were successfully treated with sulphadiazine. (2) Clinical cure was obtained in all cases in from 24 hours to 7 days. (3) The dosage of the drug on the basis of 1 grain per lb. of body-weight per day, combined with the usual routine methods of treatment: (*i*) rest to the stomach and intestines by withholding food for 12 to 48 hours according to the severity of the case; (*ii*) replacing the fluid lost by the diarrhœa; and (*iii*) the use of drugs such as Kaylene powder and Kaomagma or a bismuth mixture if vomiting persisted. (4) Relapses occurred in several cases where the treatment had been stopped before completion of the course.

NOTES & NEWS

CONFERENCE OF THE ASSOCIATION OF PHYSICIANS OF INDIA

The First Conference of the Association of Physicians of India, will be held in Bombay on the 20th and 21st of April, 1946.

Those who hold post-graduate degrees or diplomas in Medicine, Pathology, Bacteriology, Radiology, Psychiatry, Dermatology, Physiology and are engaged in consulting practice in these subjects, or are teachers in these subjects are eligible for election as members of the Association.

Those eligible for membership are requested to attend the Conference and if possible to contribute papers.

For further particulars, please write to J. C. Patel, M.D., M.R.C.P., PH.D., Secretary, Scientific Sub-Committee, The Association of Physicians of India, Back-Bay View, 1st Floor, New Queen's Road, Bombay.

FIRST INDIAN CONGRESS OF RADIOLOGY

The First Indian Congress of Radiology will be held at Madras from the 13th to 16th February 1946 under the Presidentship of Dr. M. D. Joshi, M.B.B.S.(BOM.), D.M.R.E.(CAM.), F.C.P.S. (BOM.), J.P., Bombay.

Four sections dealing with X-ray Diagnosis, Radio Therapy, Radiation Physics and Radio Biology will be a feature of this Congress under the Chairmanship of Dr. S. C. Sen (Delhi), Dr. K. P. Mody, (Bombay), Dr. R. Naidu (Bombay), Dr. V. R. Khanolkar (Bombay) or Dr. Bhaskar Menon (Vizagapatam), respectively. These sections will be consecutively held at the general sessions of the Conference. Each section will open with an address by its Chairman. Papers will then be read, discussion will follow and the Sectional Chairman will wind up their respective sections. The President of the Congress will deliver his Presidential Address at the inauguration meeting and will wind up the whole session with his concluding remarks. This Congress is held under the auspices of the Indian Radiological Association.

Those who are interested in attending this Conference are kindly requested to get in touch with the General Secretary, Dr. P. Rama Rau, 155-157 Poonamallee High Road, Kilpauk, Madras.

PRINCESS TSAHAI MEMORIAL HOSPITAL

Following appeal from eminent physicians, surgeons and hospital matrons of Britain has been received:

"During the years 1936-1941, in which Italy exerted uneasy rule over Ethiopia, whose liberties have now been regained by the aid of Britain, the Emperor of Ethiopia lived in this country. His daughter, Princess Tsahai, undertook training as a nurse at the Great Ormond Street Hospital for Sick Children and, after passing the examination qualifying her to become a State Registered Nurse, she entered Guy's Hospital for further training. Her object was to help the country which had given her hospitality and also to fit herself to lead the movement for a modern medical and nursing service in Ethiopia, after its freedom had been restored for she never doubted that right would triumph in the end. When this time came she returned to her country with the nucleus of the organisation she intended to create: but, most tragically, her great work was stopped by her illness and death at the early age of 22, on August 17th, 1942, only a year after her return home.

"An appeal is being made for funds to found in Ethiopia a Hospital with Medical School and Nursing School, Library and Ambulance Services, in memory of the Princess Tsahai, and as a token of goodwill to Ethiopia from the people of Great Britain.

"A target of 100,000 was set for the Hospital fund, of which the first half has been raised, and for which a further effort must now be made.

"Please draw and cross cheques and postal orders in favour of Princess Tsahai Memorial Hospital Fund, and address them to Lord Horder, Hon. Treasurer, Princess Tsahai Memorial Hospital Fund, C/o. H. Reynolds & Co., Chartered Accountants, 1, Bloomabury Court, High Molborn, W.C.I."

NOBEL PRIZE FOR MEDICINE

It was announced in Stockholm on Oct. 25 that the Nobel Prize for Medicine for 1945 has been awarded jointly to Sir Alexander Fleming, F.R.S., F.R.C.P., F.R.C.S., professor of bacteriology, University of London, at St. Mary's Hospital Medical School; Sir Howard Florey, PH.D., M.B., F.R.S., professor of pathology in the University of Oxford; and Dr. Ernst Boris Chain, lecturer and demonstrator in chemical pathology in the University of Oxford. This award is made by the Karolinska Institute for the discovery of penicillin and its healing effects. The institute recognizes Sir Alexander Fleming as the real discoverer of penicillin in 1928, and praises Sir Howard Florey and Dr. Chain for exploiting his discovery by experimenting with its effect upon mice to the advantage of humanity. Penicillin, the announcement says, has rendered mankind one of the greatest services. It was in 1938 that a team of research workers at the Oxford School of Pathology began their investigations on the therapeutic uses of penicillin. The Nobel Prizes are awarded from a fund bequeathed by Alfred Nobel, who died in 1896; no awards were made for the years 1940, 1941 and 1942—*Brit. M. J.*, **2**:612, 1945.

THE DISCOVERY OF X-RAYS

1945 is the centenary of Röntgen's birth, and this next week the fiftieth anniversary of the birth of radiology. The x-rays were discovered in the late evening of November, 1895, by Wilhelm Conrad Röntgen, Professor of physics in the University of Würzburg. Röntgen handed in his famous "Preliminary Communication" to the Physical Medical Society of Würzburg on December 28, and it was published at once. On Jan. 6, 1896, the news was cabled from London to the world and within a matter of days the practical application of Röntgen's discovery to medicine had been confirmed. The science of radiology was born, and if it did not, like Athene, spring fully armed from the brain of its begetter, it at least lost no time in providing for itself a worthy and rapidly improving armamentarium.

As it is often said that the discovery of the x-rays was an accident, it is only fair to Röntgen's memory that we should regard for moment the accomplishments of his predecessors and his contemporaries. In this brief recital of the fundamental discoveries British science shines with a very brilliant light. Hauksbee not only made improvements in the air-pump, but was also the first to produce an electrical discharge in a vacuum (1709). William Morgan, a doctor and one of the greatest of actuaries, did a highly original experiment by which he demonstrated that the quality of the rays produced in a partial vacuum depends on the hardness of the tube (1785).

Goldstein (1876) introduced the term "cathode stream" for the rays which are emitted from the cathode when an electric discharge is passed through a partial vacuum and Sir William Crookes really laid the foundation of atomic physics by his demonstration that these rays could be deflected by a magnet, and that they, therefore, consisted of electrified particles of matter. Crookes must have produced x-rays very frequently without realizing their nature, and he actually noticed—and complained of—the fogging of photographic plates in the neighbourhood of a Crookes tube in action. Sir Herbert Jackson invented in 1894 a focus tube for use in his experiments on phosphorescence, and x-ray photographs were taken with this original tube after the announcement of Röntgen's discovery. The early researches of Sir J. J. Thomson were carried out with Crookes and Lenard tubes. It was Röntgen's discovery which first focused the chief attention of physicists on the effect of various types of rays on gases, and Thomson himself said in 1896 that the discovery appealed "to the strongest of all human attributes-namely, curiosity."

Röntgen was Rhinelander who was born in 1845, so that this year marks the centenary of his birth. In 1888, when he was called to the chair of physics at Würzburg, he had already held three professorships. He spent twelve happy years at Würzburg, and he left it only under pressure in 1900 to fill the corresponding chair in the Bavarian capital. Röntgen was a hard worker, and his papers were numerous and marked by brevity, sincerity, and accurate work. His other contributions to physics, though important enough in their way, were outdistanced by his single great discovery.

Röntgen began serious work on the cathode rays towards the end of October, 1895. Even at that time barium platinocyanide was in common use as a test for these rays, and he was working with a Crookes tube which was covered with a black paper screen, opaque to all known rays. On Nov. 8, 1895, while he was testing the opacity of this screen, he noticed that some crystals of the fluorescent salt of barium which were lying near were showing active fluorescence. It seems very probable that the discovery of x-rays at that particular time depended upon Röntgen's reaction to this observation, which must have been made previously by other workers. By moving the crystals outside the range of the cathode rays he at once confirmed the fact that he was dealing with a new kind of ray. By placing various bodies in the path of the rays he showed that their opacity was roughly in direct proportion to their density, and when he placed his hand in the path of the rays and saw the shadow of the bones on the screen of barium platinocyanide he was quick to realize that by substituting a photographic plate for the screen he could obtain a permanent "shadowgraph" of the interior of human tissues. The first x-ray of part of the body was the photograph of Frau Röntgen's hand. There appears to be no truth in the theory advanced years later by a former student of Röntgen that a series of coincidences presented the discoverer with a shadow-photograph of a key placed between the pages of a book. Röntgen admitted a short time afterwards that he was looking for invisible rays. He prosecuted his discovery with the utmost vigour, and in his first communication. "On a New Kind of Rays", completed eight weeks later, he presented a sound description of their properties.

After the announcement of the discovery to the world on January 6, 1896, the "new photography" was taken up widely by medical men, by electrical engineers, and by "straight" photographers. In this country within a week of the announcement the first x-ray photograph of a human hand was taken by Campbell Swinton and Stanton. The *Lancet*, (Jan. 11, 1896) was the first medical Journal in this country to comment on Röntgen's discovery, and in its leading article the wit of Mr. Samuel Weller was invoked to pour a cold douche upon the supposed possiblities. By the following week the *Lancet* admitted that the medical application of the discovery as a shade nearer probability. Meanwhile the *British M. J.* (Jan. 18, 1896) came out with a carefully considered and laudatory article by Prof. Schuster, of Manchester, and assessed the new discovery at its proper medical valuation. From that date onwards all Journals contained numerous articles on x-ray and their applications. Too much credit can hardly be given to the early British pioneers for their continuous endeavours to improve x-ray plant, to reduce exposure time, and to inaugurate x-ray therapy. The policy of this Journal was also progressive and expectant from the start. As early as the beginning of February, 1896, the *British M. J.*, appointed Mr. Sydney Rowland, of St. Bartholomew's Hospital, as a Commissioner to report on new developments in x-rays, and week by week he continued to publish his highly interesting articles. Another original pioneer was John Macintyre, of Glasgow, who not only advanced the boundaries of the art of taking "x-ray photographs" of the body but who was also the father of fluoroscopy, of the principles now used in minature radiography, and x-ray cinematography. There are many others who should have a place in any more extensive list, and our gratitude should also go out to those martyrs whose researches led to their disablement and death.

Röntgen himself was the first to make an x-ray photograph of a piece of metal, and this led to the wide industrial uses of the method in metallurgy. Even though we chose to regard his discovery as a logical outcome of the work which had been done by others during the preceding thirty years, it was nevertheless the trigger which released the stream of great discoveries in atomic physics. The work of Becquerel, the Curies, J. J. Thomson, Millikan, and Rutherford built the steps which led, we might almost say inevitably to the conquest of the atom and the unthinkable possibilities of the atomic bomb.—*Brit. M. J.*, **2**:608, 1945.

ATOMIC ENERGY AND CANCER

When Henri Bacquerel looked at the first autophotograph of uranium his eyes were no doubt full of wonder; but he might have looked aghast if his vision had leaped the intervening years to Hiroshima. At a time when the scientific world is ready to celebrate the fiftieth anniversary of the discovery of x-rays (1895) and radio-activity (1896) the roar of the release of uranium's energy sounds in our ears. Among the many speculations on the future application of atomic energy, if possible to save rather than destroy, the question is asked whether it can be used in medicine and in particular for the treatment of cancer. Newspapers report that in accepting a large grant from the Sloan Foundation the director of the New York Memorial Hospital for the Treatment of Cancer and Allied Diseases said "it was believed that the release of atomic energy might be connected with the cause and cure of the disease." As to this we are still in the dark; but radiologists can see steadily enough that the cure of cancer by any kind of rays is not coming to pass just because there may be more energy available. The ques-

tion of having enough energy for the purpose in fact hardly arises; there is generally plenty for treatment. A new epoch would open only if some form of directed energy were made available which widened the margin of susceptibility between malignant cells and normal contiguous cells. In the case of x-rays and radium this margin is all too small, and no mere increase in their power is likely to alter it—unless this ratio of susceptibility is a function of the rate at which energy is absorbed, of which there is at present little evidence.

All we are so far entitled to say about the possibility of using atomic power units against cancer is that one should neither deride it nor pin any great hope on it.

The committee of nine appointed, under the presidency of Sir John Anderson, F.R.S., to advise the Government on the future of atomic energy "both as regards its international treatment and its further development in this country, whether for industrial or military purposes includes one medical man, Sir Henry Dale, president of the Royal Society.—*Lancet*, **2**: 280, **1945.**

ORGANISED RESEARCH ON CANCER

The Alfred P. Sloan Foundation announces a grant of 4 million dollars to found in New York an International Institute for the Study of Causes and Treatment of Cancer. The plans call for combining the skill and training of medical investigators from America and Europe at one centre the Memorial Hospital for Treatment of Cancer and Allied Diseases. "High-geared efficient methods of modern industrial research will," it is stated "be applied to resarch in the field of cancer over a 10 year period," during which time, "it is hoped that the cause of cancer, still unknown to science, will be found and a test devised to determine cancer susceptibility so that steps can be taken to prevent." The atomic bomb, which was developed by a 200-million-dollar research programme, is cited as an illlustration of what can be accomplished by scientifically organised research. With a 4-million-dollar grant, expected to be matched by public contributions, research-workers will be assured that financial support will not be cut off. The intention is that the best scientific brains in the field of cancer study will cooperate as one unit at one centre instead of carrying out individual study—*Lancet*, **2**:283, 1945.

HEALTH IN EUROPE

Increased contacts due to increased community life and migrations have resulted in a fairly general rise in diphtheria, scarlet fever and meningitis prevalence in Central, Northern and Western Europe. The same causes have had the same result with regard to typhus fever in Eastern and South-Eastern Europe.

Destitution—that is, lack of food, shelter, body-linen, soap, etc.—has contributed to the increase of typhus fever in endemic areas and among prisoners from these areas. These factors did not influence appreciably the incidence or severity of other epidemic disease.

Food insufficiency in its more severe forms has caused actual starvation in the whole of Greece and elsewhere among inmates of prisons and internment camps, and the poorer inhabitants of some cities. In its milder but chronic form, food insufficiency has caused a definite increase in the tuberculosis mortality and in the general mortality of several countries. It has been the main cause of many deaths, but also an effective contributory cause to a much greater number, particularly among elderly people.

As far as mortality is concerned, infants have, generally speaking, been spared, but this does not mean that they have not suffered from many forms of non-fatal malnutrition, as have adults, stunted growth in the young being the equivalent of loss of weight in older individuals.

Food shortage and malnutrition have prevailed far more severely in cities than in rural areas. This fact is of capital importance for the planning of food relief.

If this relief is prompt and adequate, and followed by a rapid economic improvement, one may expect, on the basis of experience gained during the aftermath of the first world war, a comparatively rapid physical rehabilitation of population groups now suffering from malnutrition, with a rapid fall of tuberculosis mortality.

One may reasonably expect that the return to their homes of the millions of prisoners-of-war, of the conscripted foreign workers now held in Germany, and of the demobilised soldiers of the victorious and vanquished armies, will not result in large scale epidemics, as most of the areas from which they will come can be regarded as clean from the epidemic standpoint.

Typhus fever prevalence in Eastern and South-Eastern Europe is the main exception to this general statement, and troops coming from these areas, as well as from North Africa, will require careful delousing to prevent the spread of that and other louse-borne disease—*Bull. Health Organisation, League of Nations.*

DRUG DEVELOPMENT IN WAR-TIME GERMANY

A report of Science News Letter, September 22, 1945, gives an account of some of the important developments in drug in Germany during the war. The German chemists developed a synthetic chemical called Periston as a substitute for blood plasma for the treatment of shock in their war wounded. Periston is a polymer, polyvinyl pyrrolidone, and resembles albumin in some ways. It is reported that over 300,000 units of Periston were used on military personnel, apparently without harmful effects.

For fighting infection in wounds, the Germans pinned their faith on sulpha drugs. Marfanil was widely employed for such purposes. A new sulpha drug, Globucid, behaving as sulphadiazine but having a lower cost of production was produced in quantity. They also developed two other germ fighters, dibromo and tetrachloro compounds of Salicil, which are still under study.

German interest in antimalarial drugs did not flag during the war. Some of the anti-malarial drugs studied, such as a quinoline derivative called Sontochin, had some promise, but were clearly inferior to atabrine which was in large production in Germany during the war years.

Domesctic poppies were used as a source of a pain-relieving drug when imports of opium were cut off.

Demand for hormones and vitamins, both synthetic and natural, greatly increased, and efforts were made to produce these in larger quantities. In several instances, technical improvements, were made in their methods of production. Purity of drugs and final products, it is reported, was maintained with meticulous care—*Science & Culture.*

CORRESPONDENCE

The Editor is not responsible for any views expressed by contributors

SEX DETERMINATION

SIR,—With reference to your letter D/11 July, 1941, I am sorry to say I was so hard up for want of time that I could not reply to your letter. Busy with my work in sex determination and with my work in the military I could not get any chance to give a satisfactory reply. I must admit Captain Sivapuri's impulsive letter needs more tactful handling than I am capable of. However with the meagre ability I possess I am making an attempt to satisfy him as best as I can. The census by careful examination of each province shows that amongst the real Bengalis, the real Biharis and the real Madrasis the number of females is greater than males. By 'real' I mean as distinguished from those who go to Bengal, Bihar and Madras to settle in those Provinces such as the Punjabees, Gujratis, Maharattis etc. Whereas in the Punjab, U.P. etc. the number of boys is greater than females and it is therefore that kidnapping goes on to supply the needs of the Punjabees etc. I therefore say that if more girls are procreated among Punjabees etc. and more boys among Bengalees etc. the sex balance would equalise; then there would be first no need for kidnapping girls to supply the needs of Punjab etc. and every girl would get a husband and every boy a wife in all the Provinces and secondly when the number of boys and girls would equalise there would be an automatic disappearance of the dowry system because the dowry system is totally dependent on the fact that there is an abundant number of girls and a scarcity of boys and thus in the marriage market the one girl's father outbids the other and thus we see the highest bidder who is probably a wealthy man gets the benefit by an unusual raising of the price. I think I have explained enough for even the most casual observer to understand what I mean. So much for kidnap and dowry system.

As regards sex determination, the method is not so cut and dry like a bolus of quinine to be swallowed as soon as it issues out of the machine, for the cure of malaria.

Captain Sivapuri says "Lot of work has been done on this subject in various countries with not much success". Has he ever taken the trouble of following the discussions which have taken place at the gynæcologists' conference at Amsterdam in 1938. Many speakers reported remarkable results *of widely divergent methods* in voluntary determination of the sex. Billman treated 31 cases according to Unterberger's method which relies on the theory that the sex of the child is fixed at conception and depends on the chemical reaction of the interior of the vagina. Alkalinising the interior secretion of the vagina according to Unterberger causes the development of the male child.

Method—The period of ovulation was accurately determined by Knaus's method and then vaginal washes with a solution of soda bicarb, were prescribed twice daily for 5 days before the period of ovulation. The husband was stimulated sexually by yohimbin and caffeine citrate. Sexual abstinence was prescribed during the first part of the menstrual cycle and coitus was only allowed 48 hours before the time when conception was possible. After the conception period only coitus condomatosus was allowed until the next menstruation. This methods caused 31 women to conceive; 27 gave birth to male children.

Rubsamen of Dresden confirmed the fact which had already been discovered by Fellner and Koch that hyperfeminisation of the women before conception led to the production of male children. 73 per cent of 170 women gave birth to male children by the above method. Let me assure him (Capt. Shivapuri) that all these methods combined with Plasley's theory of chromosomes has given me success in my tenth case and God willing I shall be able to publish my eleventh case result as soon as successful. When in 1941 I wrote my correspondence I had done 4 cases only. I think I have given Captain Shivapuri my method in detail derived from the above to try his skill on his patients. If he still is unable to follow my method let him advise his patients to start my treatment and he will see how I treat them with success. Along with the theory there is a mental factor also which is absolutely personal and cannot be handed over to any body like cooked food to be swallowed as soon as ready. It is entirely a personal quality and has to be acquired by long practice; as an example I would like to point out that there is in London a famous bonesetter who has been knighted. When asked how he sets bones, he exhibits his hands and says that his hands are responsible. He is a man who has no medical degrees and has acquired by practice some thing which is not given in books.

Nuncio the great Italian painter unrivalled for his painting was once asked by his friends as to how he mixed his colours. He reply was 'with brains sir'. This I hope will be enough to satisfy him (Capt. Sivapuri). I am etc.

86, Girish Ch. Bose Rd.,
Lucknow,
9-10-45.

C. C. BOSE, L.R.C.P., L.R.C.S. (EDIN.), L.R.F.P. & S. (GLAS.), L.M. (DUB.),
Late Recruiting Medical Officer, Bihar.

DOCTORS FOR ATTENDING ON MEDICAL PRACTITIONERS AND THEIR DEPENDENTS

SIR,—I was painfully surprised to read in the issue of the Journal of October, 1945, Vol. XV on page 34 under the heading 'Doctors attending on Medical Practitioners and their Dependents', a letter from Dr. S. K. Das, Calcutta, complaining indifference and neglect shown by Doctors in Calcutta to attend on medical practitioners and their relatives during their illness. Dr. Das suggests as a remedy that 'Medical Practitioners must charge their fees for attending on fellow practitioners and their relatives.' This suggestion comes from his belief that 'the reason cannot be anything but money'.

I am sorry for Dr. Das's experience which is entirely against that of mine and that of several others on this side of India. A well-known busy general practitioner in Poona who is now dead, used to run to any fellow practitioner in Poona the moment he learnt that he was ill. He always gave first attention to the near dependent relatives of other practitioners and felt insulted if fees were offered to him in such cases! His example is being followed by many others in Poona and I have not heard during my 30 years' experience as a general practitioner, any such complaint from my co-practitioners in Poona. Hence Dr. Das's complaint came as a surprise to me and others in Poona.

The underlying reason of Dr. Das's complaint is not 'money' but very likely lack of complete social contact, professional jealousies, tendency to malign other practitioners, criticizing them and their ways in an uncharitable manner and so on. After all human nature is the same everywhere and

(Continued at foot of col. 1, page 134)

REVIEW

VENEREAL DISEASES—by K. D. Lahiri. 1945. Pages 193. Illustrated. Published by Himalaya Publications, Patna. Price Rs. 2/15/-.

This little book on Venereal Diseases written by Dr. K. D. Lahiri contains a mass of information within a small compass of one hundred and ninty two pages only. It deals with seven conditions according to modern conception of venereal diseases; and the book has been brought up-to-date as far as practicable under the present condition. There is, however, considerable room for improvement in several directions. The photograph illustrating 'secondary rash' for instance, does not show any kind of eruption, an index is wanting, and while a relatively large amount of space has been devoted to the academic aspect of the diseases concerned, the treatment part with which the practitioners are more interested needs further clarification.

On the whole the author is to be congratulated for writing this book subsequent editions of which with slight additions and alterations, are expected to be of great value to the general practitioners.

A. GUPTA

(Continued from page 133)

if you are helpful and charitably disposed to others in time of need and necessity, it rarely happens that you are not reciprocated. Our great Association is meant to develop among other things a sense of fellow feeling among practitioners and if we fail to work in that direction, results are likely to be what Dr. Das has described. The remedy therefore is not 'paying fees' but developing social, cordial and loving attitude towards other practitioners.

Poona City, N. L. RANADE
21-12-45.

VILLAGE DOCTORS

SIR,—We, as village physicians, who with all sorts of difficulties and disadvantages in the villages, have taken the risk of settling in these poor villages of Bengal, where no body enters to have a glance of the daily need and to enquire how they live and die preacefully without any murmur. We are also getting the same sort of neglected behaviour from the authorities who never care to hear our grievances for the uplift of the village dispensaries and so called Famine Relief Hospitals. Rumour goes the latter Hospitals would be abolished very soon in which case, we, who are attached to these Hospitals would feel difficulties not only regarding pecuniary condition but also of a great chance of getting in-door patients under our supervision to have a knowledge of thoroughly studying the cases, who were so long deprived of any rational treatment. There is a Government Scheme of making a few F.R.E. Hospitals provincialised.

May I, being a physian under the Subdivision of Nilphamari in District of Rangpur, appeal through the Association that this being the worst sufferer among the Subdivisions of Rangpur due to famine in 1350 B.S. the Hospitals may kindly be provincialised with all sorts of facilities to us, the local qualified doctors, in this special locality where there is scheduled caste majority and thereby enable them to receive rational treatment from which they are almost deprived of. I am etc.

Dimla (Rangpur), S. C. MAITRA, L.M.F.
6-12-45. *Medical Officer, Dimla Charitable Dispensary.*

OBITUARY

CAPT. P. GANGULI

Captain P. Ganguli was a man of extensive knowledge in almost every subject of medical science. He joined Government service as an Assistant Surgeon in 1907, and the I.M.S. during the first world war when he was posted to several important stations. He reverted to his permanent service with the rank of Captain. He was posted to several places including the Dacca Medical School as Teacher of Medicine for 7-8 years and retired as Visiting Physician to the Calcutta Medical College Hospitals in 1938. He went abroad twice and got various distinctions in London and Vienna. Among his academic distinctions were: (1) Gold Medalist in Physiology in 1905, (2) Certificate of Honour in Pathology and Bacteriology, (3) Gold Medalist in Medical Jurisprudence in 1906, (4) D.T.M. in 1922, (5) Zeugnis by the University of Vienna in 1931, (6) Fellow of the Royal Society of Medicine, London in 1936.

P. GANGULY, B.A., L.M.S., D.T.M., CAPT. I.M.S. (LATE)

He was Assistant Editor, Journal of the Indian Medical Association during 1939-41 and at the time of his death Editor of the Calcutta Medical Review.

He had been suffering from heart trouble for some years, and in fact, it was for this reason that he went to Vienna and other places to qualify himself as a specialist in heart diseases. He was one of the few doctors in India who started the use of inductothermy for the treatment of various diseases.

Capt. Ganguli had a delightful and amiable temper which made him highly popular among his friends and patients. His loss to the profession is very great indeed.

He has left behind his wife, three sons, one of whom is a medical graduate, and one daughter. Our heartfelt sympathies to the bereaved family.